

THE AMERICAN MEDICAL MONTHLY AND NEW YORK REVIEW.

M A Y, 1861.

ESSAYS, MONOGRAPHS, AND CASES.

A Lecture on Puerperal Convulsions; the Sixth of a Course on the Complications of Labor, delivered in the University Medical College, New York. By T. GAILLARD THOMAS, M.D., Lecturer on Obstetrics in the University Medical College, Secretary of the New York Academy of Medicine, Physician to Bellevue Hospital.

GENTLEMEN—I do not think that it would be possible to give you a comprehensive view of the subject of to-day's lecture, without making some prefatory remarks upon convulsions in the non-pregnant state. In doing this, I will be as brief as is consistent with a faithful exposition of the present state of pathology, on a point about which even now much diversity of opinion exists, and then occupy your attention with those varieties met with in the puerperal condition.

The term convulsion may be defined as a violent, irregular, and involuntary contraction of muscles ordinarily under the control of the will, and from certain peculiarities have been divided into two great classes—tonic and clonic.

An attack characterized by lengthy and continuous muscular contraction is called a tonic convulsion, while one in which the spasm of the muscles is rapidly intermittent, is styled clonic; an example of the first class is tetanus, and of the second epilepsy.

The first of these varieties does not concern our present investiga-

tions; so, leaving it out of consideration, we proceed at once to the second, which may be greatly simplified by a proper division and classification.

All clonic spasms, when fully developed, whatever be their form, may be grouped under three heads:

1st. Simple convulsions.

2d. True epilepsy.

3d. Epileptiform convulsions.

The first includes those convulsive seizures which are general, but are unattended by loss of consciousness, as hysterical and choreic; the second defines its own meaning; the third comprises those which resemble true epilepsy in loss of consciousness, and many other particulars, and yet differ from it in others, which prevent their being treated of synonymously.

Taking epilepsy as a type, as it may well be considered, we have named the third class from its resemblance to this type. In truth, the real difference which at present exists between the second and third forms is, that the second occurs habitually, while the third does not; and that for the second we cannot assign a cause, while for the third we can.

This may appear to be a singular ground for distinction, and yet it is the true one. Who, for instance, would call the convulsions due to teething or crude ingesta epilepsy? And who would not do so, if similar seizures occurred habitually, and without ascertainable cause?

By some authors a variety of convulsive attacks besides these three are cited, but I cannot agree in the propriety of their admission. For instance, "apoplectic convulsions" are spoken of. Now any severe eclampsia may produce apoplexy, which results from the great cerebral congestion accompanying the seizure; or the effusion of a clot of blood upon, or in the substance of, the brain, may by centric irritation produce epileptiform convulsions. But why call these apoplectic convulsions? In one case apoplexy is the result of an epileptic or epileptiform spasm; in the other it produces eclampsia of those varieties, and no one has the right arbitrarily to characterize these by a special name, any more than they would have to call those due to teething dental convulsions, or those arising from crude ingesta gastric convulsions. If it is meant that a peculiar kind of convulsion is very apt to result in rupture of a cerebral blood-vessel, a dangerous error is by this nomenclature promulgated, for, given a fatty state of those vessels, and any, even the slightest seizure, may result in that accident.

All the general and clonic convulsions, then, which you will meet

with in practice, may be classed under one of these heads, let them occur in the child or the adult, the male or female sex, the pregnant or non-pregnant woman.

Having gone so far as this, you will now be able to listen intelligently to the investigation of the question, to which of these three classes belong those seizures which occur in the pregnant or parturient woman, and which are known under the generic term of "puerperal convulsions."

I do not wish you to accept of my statement upon this subject, nor adopt my view with reference to it, without careful examination of, and reflection upon, the grounds upon which I offer them.

As in the non-pregnant, so in the pregnant state, three varieties of convulsions may occur—the hysterical, the epileptic, and the epileptiform; and by many, any one of these occurring in the latter state would be styled puerperal convulsions. This term, however, should as far as possible be confined to those (not simply occurring in, but) dependent upon the state of puerperality. We would not call an attack of pleurisy occurring to a lying-in woman puerperal pleurisy, but if there were a variety of that disease due to, or very much influenced by, the puerperal state, such an appellation would be highly appropriate. So with convulsions. Hysterical convulsions are common in all excited states of the female system, and occurring in the puerperal state, should be regarded as hysteria. Epilepsy, so far from depending in any degree upon pregnancy, is very rare at that time; and even the patient who is liable to that disease in the non-pregnant state, may escape its seizures during the puerperal.

With epileptiform convulsions, however, this is not the case; they are often, in fact generally due to this state, and seldom occur in the adult, without its influence. Therefore the term puerperal convulsions should, I think, convey to the mind of the hearer the idea of eclamptic seizures of epileptiform character; not of hysteria, not of true epilepsy, nor yet of apoplexy, but of a seizure *dependent on and due to the state which gives it its distinctive name*.

This, then, is the restricted signification which I would have you always give to the term puerperal convulsion.

Causes of Epileptiform Convulsions.—The causes of epileptiform convulsions may be enumerated as—

- (a.) Reflex or eccentric irritation, as from dentition, crude ingesta, pressure on the os uteri or vagina in labor, &c.
- (b.) Centric irritation, as in cerebral disease, meningitis, pressure on the brain, &c.

- (c.) Poisoning of the blood by bile, urine, or some of its constituents, carbonic acid, &c.
- (d.) Specific poisons, as lead, strychnia, the various narcotics, &c.
- (e.) Disorder of the cerebral circulation, as from congestion, anæmia, &c.

Any one of these causes existing in sufficient degree in the non-pregnant state would produce epileptiform convulsions, and existing even in less degree they would likewise do so in the pregnant, when the nervous system is in a plus state of excitability, and the reflex influences more than ordinarily acute. At the same time that I admit that any of these causes *may* produce puerperal convulsions, I wish with the utmost distinctness to state my belief that, in the vast majority of cases, poisoning of the blood by some of the constituents of the urine is the great cause of the seizures. I admit the other causes mentioned, not upon the evidence of old writers, who, not being awakened to the frequency of this cause, did not seek for its existence, but upon that of modern observers, who have carefully tested the urine and blood before drawing their conclusions. Thus three distinguished obstetricians of this city, Drs. Barker, Elliott, and Gardner, have informed me of a few undoubted cases of this kind, which have occurred in their practice; and others have been reported in the journals of the day, of the correctness of which I entertain no doubt.

To that class of cases reported in such large numbers, however, as being due to some indiscretion of diet, or to pressure of the head against the os uteri or vagina, (which of course exists in every case,) without any interrogation of the renal secretion for disorder of the kidneys, I have not the slightest respect. However full of sound they may be, they signify nothing; or at most, all that we should admit with regard to them is, that the irritation charged with the whole evil is only an exciting cause; the great predisposing one having been undetected, (probably because unsought for.)

While house-physician in Bellevue Hospital, a young man of robust frame and great muscular development, with every appearance of having enjoyed excellent health, was brought into the wards under my charge in an insensible condition, and presenting the phenomenon of violent epileptiform convulsions. I say the phenomenon, for it is really one to see a perfectly healthy man suffering from true epileptiform convulsions. I could not account for the attack, and treated him upon general principles, among other remedial measures, using an enema of oil and turpentine. This acting, about a gill of cherry-stones were discharged, with very little fecal matter. The patient

died, and, upon a post-mortem examination, nearly a pint of stones were found in the caput coli, the ascending colon, and the ileum. Now, as it is a perfectly fair and rational conclusion that these stones caused the convulsions which caused the death of the healthy and powerful man, it would be utterly irrational to say that they would not have produced a like result in a hyperæsthetic and excitable pregnant woman. Nevertheless, as such results from such causes rarely occur in the non-pregnant, so do they in the pregnant state.

I have never met, in my own practice, with puerperal convulsions, where in every instance uræmia was not the undoubted cause.

You may then, I believe with safety, fix in your minds the following as an axiom: as a rule, puerperal convulsions are due to uræmia; as a rare exception to this rule, centric or eccentric irritations may be causes of them.

You will recognize in the fact which I have just stated relative to the connection between uræmia and puerperal convulsions, one of great importance; one, indeed, a knowledge of which, has already saved many lives, and which will in the course of time save many more. A half century ago, Hamilton and Demanet noted the fact, that anasarca was very apt to be precursory of puerperal convulsions, but to Drs. Lever, of London, and Simpson, of Edinburgh, belongs the glory of having solved the important problem which has since done such service to humanity. Their views were published simultaneously in 1843, and since that time abundant corroboration has been furnished by many of the first pathologists of our day.

Pathology of Uræmic Puerperal Convulsions.—The probabilities are, that as the pregnant uterus rises in the abdominal cavity, it exerts a hurtful pressure upon the kidneys, preventing venous flow from them, produces congestion, and thus impairs their eliminative function.

From this, result a discharge of albumen in the urine, and an accumulation of some of the elements of the urine in the blood. What the poison is, the collection of which, in the blood, produces the peculiar nervous manifestations which follow, is not clearly ascertained, although numerous experiments which are being constantly instituted for the elucidation of the fact, are surely bringing us nearer and nearer to a just appreciation of it. By some, it is supposed that urea is the toxic agent, but this view is opposed by the weighty names of Bright, Johnson, Frerichs, Rees, and others.

Frerichs it was, I believe, who first promulgated the view that the urea accumulated in the blood undergoes a decomposition which re-

sults in the formation of carbonate of ammonia, which is the hurtful agent.

M. Treiste has advanced an extremely ingenious and plausible view, to the effect, that this decomposition does not occur in the circulating fluid, but that the carbonate of ammonia forms on the mucous membrane of the intestinal canal, and is subsequently absorbed. This receives corroboration from a statement by Bernard and Barreswil, that this substance is found in the intestines of animals the kidneys of which have been extirpated.

I mentioned just now that pressure of the enlarged uterus upon the kidneys was probably a cause of the disordered function of those organs; there is some other agency, however, which must be regarded as active, for tumors and fluid accumulations in the abdominal cavity, which exert the same or greater pressure, do not produce a like derangement. This influence is to be found, I think, in the peculiar state of the blood produced by pregnancy. A misconception was for a long time prevalent among physicians with reference to the state of the blood in pregnancy, many regarding it as being in a state of greater richness than that of the non-pregnant condition; in other words, that the pregnant woman is plethoric. Now, if the term plethora is employed to signify a "fullness," or great amount of circulating fluid, this is true; but it is not so if it be used, as it often is, to indicate that the blood is rich in red corpuscles. Andral and Gavarrel, Becquerel and Rodier, and other equally eminent men, have analyzed the blood of numbers of pregnant women, and pronounced it to be, on the other hand, in a watery state, which receives the name of hydræmia.

The following are the statements of Becquerel and Rodier: "*Recherches sur la Composition du Sang, 1844.*" "These are the alterations which it (*i. e.*, the blood of pregnancy) undergoes:

Diminution of the density of the blood defibrinized, and of that of the serum.

Increase in the proportion of water.

Great diminution in amount of the globules.

Slight increase of the fibrin.

Diminution of the albumen of the serum, &c."

Dr. Rees believes that such a state of the blood is peculiarly conducive to the action of this toxæmia; and Dr. Todd, in his *Lumleian Lectures on Delirium and Coma*, (*Med. Gaz.*, 1850,) makes a similar statement. It is not unlikely that both of these causes are active in bringing about the results.

The occurrence of convulsions with first pregnancies is much more

frequent than with subsequent ones; a fact which is probably due to the rigid and unyielding abdominal walls pressing the uterus more firmly against the kidneys than they would do in multiparous women, in whom they are lax and yielding.

Lachapelle had $\frac{7}{8}$ of her cases with first pregnancies.

Ramsbotham $\frac{2}{3}$ of his " " "

Merriman 28 out of 38 " " "

Collins 29 out of 30 " " "

Dr. Tyler Smith remarks: "It is a very old and true observation, that convulsion is often met with in single women whose minds have been depressed by the sense of shame and misery inseparable from their condition during gestation." With all due respect, I would suggest as an explanation of this "old and true observation," much more accordant with the enlightened pathology of the time, that unfortunate thus circumstanced are anxious to conceal their shame, and, by tight lacing, press the uterus with great force against the kidneys and disorder their eliminative action.

Premonitory Symptoms.—Of course it will always be very important for you to recognize the fact that your patient runs a risk of convulsions at as early a period as possible in order to establish, as soon as your suspicions are excited, a course of preventive treatment. Let me strongly recommend to you, through your obstetric careers, to examine the urine of every pregnant woman who shows symptoms which cannot readily and satisfactorily be accounted for by the mere existence of the puerperal state, and do this more especially if œdema of the face or feet should be noticed. There are so many obscure symptoms which you will find due to puerperal uræmia, that I advise you not to wait for your suspicions to be aroused with reference to renal disease, before testing that secretion, *but always to do so as a matter of routine in the diagnosis of puerperal disorders.* Should you, after such an examination, in any period of pregnancy find the urine albuminous, and more especially should the microscope reveal in such urine tube-casts or renal epithelium, always be watchful for the occurrence of eclampsia of dangerous character, and put your patient upon preventive treatment. Do not understand me that, whenever albumen and tube-casts are found in the urine of a pregnant woman, she will have convulsions; this is by no means true, for in the vast majority of cases they will not occur, and that, too, without special preventive treatment.

In twenty cases of puerperal albuminuria, Devilliers and Regnault had eleven cases of convulsions out of forty-one cases; Blot had only

seven cases of convulsions, and Cazeaux gives the proportion as one-fourth or one-fifth.

The knowledge gained from an examination of the urine will generally be the only reliable information which we can get at any period distant from the attack, but just before the attack occurs there are a number of premonitory signs which will excite our suspicions. Among these may be mentioned drowsiness, fretfulness, despondency, dizziness, violent headache, partial anæsthesia, amblyopia, *muscæ volitantes*, impaired vision, substernal or epigastric uneasiness or anxiety, with a sensation as if of sinking, *tremitus aurium*, deafness and stertorous breathing during sleep. Study the symptoms of uræmia in the male, and you will find them identical with these; now the question arises, are the prodromata of epileptiform convulsions not due to this cause the same? Never having seen a case unaccompanied by uræmia, I cannot say but I should suppose that many of the symptoms just detailed would be absent.

Symptoms of the Attack.—You will be at no loss for a diagnosis, even in your first case of this terrible malady, for there is nothing with which you could confound it, except with a similar seizure, due to hysteria or epilepsy. In the beginning your attention will be attracted to the patient by a turning over of the eyeballs, so that only the whites remain visible; then the inferior maxilla will be drawn to one side of the face, the lips puckered so as to cover completely the teeth; the head turned upon the neck, the occiput drawn towards the spine, and soon the flexor muscles of the arms act powerfully upon those members, flex the fingers, and bring the forearms upon the chest. All these contractions take place in rapid succession, and for a time the convulsion seems clonic in character; but soon the arms jerk violently, the head is moved rapidly upon the neck, the jaws open and close with great force, a deathly pallor or lividity overspreads the face, froth more or less deeply tinged with blood oozes from the violet lips, the woman begins to take full and stertorous inspirations, and the seizure passes off. After a short sleep the patient will wake, look confusedly at her alarmed and distressed attendants, and perhaps in a half-conscious manner ask what has occurred. This attack will, after an indefinite time, be followed by another, and after two or three have occurred consciousness is generally abolished in the intervals, and stertorous breathing and a semi-comatose condition last from fit to fit. The number of convulsions which may occur before the case terminates, the frequency of their occurrence, and the

severity which characterizes them, will of course depend entirely on circumstances governing each individual case.

Frequency.—Fortunately, this dangerous complication of parturition is not of frequent occurrence. In one thousand deliveries at the "Hospital of the Clinic," Velpeau met with not a single case; but this exemption was remarkable, the estimated proportion being about 1 in 485 deliveries.

Differential Diagnosis.—The differentiation of true puerperal convulsions from the epileptic and hysterical seizures which may occur in the puerperal state, is based upon the same principles which would govern the same destruction in the non-puerperal condition. That it is true epilepsy, will be known by the fact of the patient having been liable to attacks of that nature previously, and the conclusion thus based would be strengthened by discovery of a healthy state of the urine. Hysteria will be recognized by partial consciousness during the attacks, by their lengthy duration, by their slight intensity, and by the general hysterical behavior and character of the woman. There is a peculiarity in hysterical seizures, which can be gathered only by observation, but cannot be written, which will generally enable the physician to determine as to the true nature of the case; though sometimes the most skillful diagnostician is puzzled to decide.

Prognosis.—The prognosis of true puerperal convulsions is very grave for both mother and child.

According to Braun, one-third of the mothers die; according to Churchill, one-fourth; and Bomberg says one-half. In my experience, one-fourth have died.

It is a very significant fact, that those cases of uræmic convulsions accompanied by œdema are not as dangerous as those not thus accompanied. The reason appears to be, that the effused serum contains an appreciable amount of urea, which is thus gotten rid of by the blood. Of 4 cases without œdema, Blot lost 3; of 3 cases with œdema, he lost 0. In 2 cases without œdema, Regnault and Devilliers lost both; of 9 cases with œdema, they lost 5. Cazeaux gives the mortality of those cases with œdema 11 in 55 +; of those without it, 7 in 15. Bear this in mind, not only on account of its great interest and importance, but because I will return to it very soon, as we progress, and base upon it what will, I think, at a future period, be considered an important point in treatment.

Unfavorable as is the prognosis for the mother, for the child it is more so. It may be safely stated, that it is a very exceptional oc-

currence for a child born of a mother who has suffered from even a few violent convulsions, to recover.

Causes of Death.—The attacks may recur with varying rapidity and severity, until the exhausted patient is destroyed, or the very first convulsion (as in a case recorded by M. Depaul) may snap the thread of life. In addition to exhaustion from oft-repeated attacks, the life of the woman may be destroyed by apoplexy, the result of rupture of one of the cerebral blood-vessels; asphyxia, the result of spasm of the glottis and muscles of respiration; intra-cranial or pulmonary serous effusion, the result of transudation through the walls of the distended capillaries; coma, the result of cerebral congestion; or paralysis of the heart, the result of violent spasm of that organ.

I was for some time under the impression that death was attributed to the last of these causes, upon grounds which were purely theoretical; but witnessing a case in which I believe that death thus occurred, has caused me to change my mind. The case was this: A young Irish woman, to whom I was called by the late Dr. Murphy, of this city, was suffering from repeated attacks of the most violent convulsions. I was standing by her side, with my fingers on the pulse, which was beating with a fair amount of force, when a seizure took place. It passed off, and the heart, beating once or twice very feebly, ceased entirely to act in less than ten seconds.

Now, we had here no evidence of injury done to the brain; the woman did not die of asphyxia or exhaustion, and I know of no way in which to account for the sudden death than by supposing that the heart, overcome by violent spasm, refused to perform its function. Even if great cerebral lesion had occurred, death from it would not have been so instantaneous. Persons affected by apoplexy never die *instantaneously*; those who die of cardiac disease often do. In the case just detailed I performed the Cæsarean section, but the child was dead.

If the patient seems to be improving, and the convulsions have ceased, a prognosis with reference to the probabilities of their return will depend, I think, more upon the amount of albumen found in the urine than upon anything else. Should this substance diminish rapidly, a very favorable prognosis may be made; but never should the patient be regarded as out of danger until it entirely disappears.

As regards the prognosis to be made with reference to the probabilities of a return of the kidneys to a healthy state after delivery has taken place and the convulsions ceased, I should say that it should be generally decidedly favorable.

Causes of Infantile Mortality.—The causes for the great infantile mortality observed in such cases are these: The placenta, compressed by abdominal spasm, and supplied by poisoned blood, ceases to exert a proper influence on the blood of the fœtus; or the child, suffering from uræmia like its parent, may die of intra-uterine convulsions. Even if born alive, its chances for life are not good, for many infants thus circumstanced die within the first twenty-four hours of their existence.

Even after the disappearance of the convulsions, after the accomplishment of the labor, and after convalescence under ordinary circumstances might be considered fully established, the prognosis for the mother is rendered grave by the fact that such cases are often subject to uterine inflammations.

Preventive Treatment.—Having been led to believe that there is a probability of puerperal convulsions in any case, these I believe to be the best means for avoiding the disastrous issue. Let the diet be light and nutritious, and let it consist of very little animal food; see that the bowels are kept very regular by means of saline cathartics; direct the patient to take regular exercise in the open air, avoid late hours, heated rooms, exciting company, and stimulating drinks; and keep the skin as active as possible by occasional warm baths, friction, and appropriate clothing. But above all, let the patient be delivered under the influence of chloroform, unless some very powerful objection should exist to its use. By these means you will often be able to prevent the occurrence of threatened convulsions, if you are forewarned of the threat a sufficient time before the *dénoûment*; and in some cases you may prevent the issue, even if you are made aware of its approach, just before the attack occurs. Let me give you an example of what I consider a case of convulsions prevented. Mrs. S., a lady who had borne two children, had passed through her third pregnancy without much trouble, and sent for me one afternoon in December, 1860, on account of commencing labor. The os was just beginning to dilate, and supposing that the labor would come on during the night, I retired to an adjoining chamber, requesting the nurse to call me when the parturient process should have progressed so far as to make my presence necessary. About five the next morning, Mrs. S. sent for me on account of a very violent headache, which had caused her to cry out, so great was its severity, and when I saw her she was rocking herself to and fro, and complaining bitterly. The nurse drew my attention to the fact that her face had become much puffed, and told me that during the night she had complained of ring-

ing in the ears, flashing before the eyes, and great nervous trepidation. At that moment she complained of great dizziness, and stated that the figures of the carpet seemed to be rapidly revolving. She was not an hysterical, or even a very nervous woman.

The pulse was full, almost bounding, and somewhat accelerated.

Obtaining some of her urine, I examined it with heat and nitric acid, and found that it was loaded with albumen.

I now administered a very active saline cathartic; caused the patient to keep her bed, and got some chloroform ready for use. I did not employ it, however, because her husband was very violently opposed to it. The labor progressed steadily, when just about the end of the first stage, a slight twitching was observed in the muscles of the face, and very slight turning of the balls of the eyes. She was now instantly put under the influence of chloroform, and kept so to the end of the labor, which was happily concluded for both mother and child. It may be said, with reference to my conclusions in this case, that they are illogical, from the fact that, even without the use of chloroform, she might have escaped what I deemed so imminent. This I allow, but I submit that few cases with so much albumen in the urine, and fewer still with so well-pronounced natural signs, escape the dread climax. I have always felt a conviction that without the preventive means adopted, that lady would have passed through a fearful ordeal, which was by them avoided; and this is not an isolated case in my experience, but is mentioned merely as a fair type of a class.

I cannot leave the subject of preventive means without offering for your consideration the question as to the propriety of the induction of abortion or premature labor in those cases where the uræmic poisoning is very great, and is evidently increasing as pregnancy progresses. I am not in a position to advise this, but it appears to me to be well worthy of consideration; and I can easily imagine cases in which the maternal and foetal life might both be saved, by induction of labor at the beginning of the eighth month, which would be lost at the end of the ninth.

Treatment of the Attack.—As the treatment of the attack will primarily consist in shutting the avenues by which death may approach, let us see what these are. They may be thus recapitulated:

- a, Apoplexy.
- b, Asphyxia.
- c, Serous effusion.
- d, Coma.

e, Exhaustion.

f, Paralysis of the heart.

In view of these, the indications of treatment may be enumerated as follows:

1st. Check the convulsive action at once, and thus prevent death by asphyxia, the cerebral conditions resulting from congestion and failure of the heart to perform its function.

2d. Diminish vascular turgescence and excessive action, and thus remove the great liability to apoplexy and coma.

3d. Evacuate the uterus, if possible, because experience has proved that in the majority of cases the seizures will then cease, and because we thus remove pressure from the kidneys.

4th. Eliminate or neutralize the poison accumulated in the blood.

To accomplish the first of these indications, no means is at all comparable with the anæsthetic influence of chloroform. Blood-letting is, in my mind, far inferior to it in its results, much more unreliable, and accompanied by much greater dangers. No greater boon could be conferred upon the obstetrician than the power of controlling these terrible convulsive seizures, and I do not believe that I exaggerate when I say, that in many, nay, most cases, such a power exists in chloroform. Ether, from the stage of excitement which it produces, is not so applicable to these cases, and, in some instances, I have found its use entirely inadmissible, while chloroform has accomplished immediately all that I desired. If serious injury, such as effusion of serum or blood, has taken place in the brain, anæsthesia will accomplish, probably, nothing; but if it be resorted to early and fearlessly, its results will surprise you.

So anxious am I, gentlemen, to fix what I believe to be a proper impression upon your minds concerning this important point of our subject, and at the same time not to say more than my experience warrants me in asserting, that I will beg your attention to the account of three cases which illustrate the matter more fully than any other means would do.

I was called to a primipara whom I had delivered six weeks before, and who had, subsequently to delivery, suffered from a slight attack of puerperal mania, and found her suffering from a most intense headache, dizziness, and confusion of mind. Her pulse was so full, and her general appearance aroused my suspicions of approaching convulsions to such a degree, as to lead me at once to test the urine, which I found to be loaded with albumen. I immediately went for chloroform, and returning, found her in a fearful convulsion, which, in spite of the ef-

forts of her attendant, had thrown her from her bed to the floor. As soon as it passed off, I put her fully under the influence of chloroform, which quieted her so, that she slept placidly for about two hours. Her family appearing very apprehensive about so free a use of the anæsthetic, I then agreed to discontinue it, to learn whether the seizures would return. No sooner was she fully awake than another, if possible, more violent than the first, came on. This I tried three or four times with the same result, and the patient was kept more or less under the influence of the anæsthetic for about forty-eight hours. During this time, she would sleep quietly for one or two hours at a time, without the inhalation of the drug, and her strength was sustained by nutritive enemata. She recovered, and the albumen gradually disappeared from the urine.

The two other cases I saw with the late Dr. John W. Francis, whose decease has so recently spread a gloom over the medical profession of New York, and so closely do they resemble each other that they may be related together. Both were primiparæ; in both the lancet was freely used, without checking the attacks, which really seemed to me to increase under the sanguineous loss, and in both chloroform acted most perfectly. Dr. Francis was at first much opposed to its use, but seeing that all other means had failed, and knowing that death would surely be the result if the oft-repeated and very violent attacks were then not checked, he consented to its use, and in neither case did he hesitate to say that the successful issue was due to its influence. One of these ladies was kept under it for about eight hours; the other about sixteen hours; in the latter, the cessation of the anæsthetic effect on two or three occasions resulted in return of the eclamptic seizures, as it did in the first case related.

To obtain the full results of anæsthesia under these circumstances, the influence must be kept up steadily and unintermittingly for twenty-four, forty-eight, or a greater number of hours, if necessary.

I do not mean that the patient must be all that time under its full influence, but that she should be sufficiently under it to effect the object in view, if it can be effected by this remedial means. But one person cannot do this, and I think that, in these cases, a capable assistant should always be associated in the case, whose entire time can be given up to it.

Should it be absolutely necessary, an intelligent non-professional assistant may be intrusted with the administration of the chloroform; but this is attended by risk, and should never be done until that individual is properly instructed by the physician, and made to gain

some experience in his presence. You may say that there must be a good deal of risk in this. I answer, there is less than in leaving the patient without the anæsthetic influence, and it is only in the face of this alternative that it should be run.

If anæsthesia controls the convulsions, blood-letting should not be resorted to; should it fail to do so, it should then be taken into consideration, and decided upon by the same reasons which would govern such a decision concerning it in pneumonia or any other diseased condition. In other words, you should not bleed because the patient has puerperal convulsions; but because some special indication, as the evidences of plethora, or too violent vascular action, for example, should point to its necessity.

Remember that, although the pregnant woman be hydræmic, she may at the same time, in one sense of the word, be plethoric; that is, there may exist an excess of blood in the system. This is called "serous plethora," and may be temporarily much relieved by the lancet, although the secondary effect of the loss is to increase the state of hydræmia. Venesection may be performed, for two reasons, in abnormal states of the circulatory system: first, to alter the state of the blood; and second, to diminish the mass which is passing through the blood-vessels, which are perhaps distended by its great amount. In puerperal convulsions it effects good results, (when it does so at all,) by accomplishing the second end at the expense of the blood's chemical state.

It is not against blood-letting that I wish to guard you, but against its indiscriminate and invariable employment; and this I do because I feel convinced that I have seen much injury done by the lancet under these circumstances. Still, I do not hesitate to employ it in those cases where I find it necessary to accomplish the second of our enumerated indications, namely, the diminution of vascular turgescence and action.

We now approach the third indication, the evacuation of the contents of the uterus. If any general rule of action could be given with reference to this point, it should, I think, be to this effect: if the os has begun to dilate, encourage and hasten the labor so soon as the convulsions are at all controlled; should the woman not be at term, endeavor to manage the case without the induction of labor, leaving it as a dernier resort, but practicing it when other means fail to check the returning seizures. I have seen a case in which chloroform entirely quieted violent convulsions coming on at the eighth month, and the lady went to term, and was delivered without a re-

turn, but subsequently died from other effects of uræmia. Her child died at the time of the occurrence of the convulsions, and was putrid at the time of birth. If you deem it advisable to bring on or hasten the labor, pass a sponge-tent into the os uteri, use the warm douche freely against this and the encircling fibres of the os, and employ the colpeurynter or a bladder placed in the vagina and filled with water. Should the os be dilated, stimulate the fibres of the uterus, by placing a gum-elastic catheter between the membranes and the uterine body, or deliver by version or the forceps.

Sometimes the bag of waters may be ruptured with advantage.

When the head of the child gets within reach of the forceps, my impression is, that it is always safe to deliver it, for every moment's delay adds to its danger. This should of course be done only when the fœtal heart is heard distinctly to be acting, for the operation is here performed for the child's benefit alone.

The means adapted to the accomplishment of the fourth indication are these: The kidneys being crippled in their functions, press other emunctories into service, and make them supplementary to these organs. I told you that Bernard and Barreswil had found the mucous membrane of the alimentary tract to be covered with carbonate of ammonia, and that Treiste supposes that from this part of the economy it is absorbed into the system. However this be, it is advisable to act freely on that surface by active cathartics; if the patient can take them, I give by preference the salines; but if she cannot swallow, croton oil may be employed. The skin is often largely supplementary to the kidneys, and this should be made to act by the hot-air or vapor bath. In addition, dilute citric or benzoic acid should be freely given, with the hope of forming in the blood citrate or benzoate of ammonia. The former may be given in the form of lemonade.

I have asked you, in the course of this lecture, to bear in mind the fact, that those cases complicated by œdema were much more favorable than those without it. Now, it seems to me that œdema produced artificially, by ligatures applied around the arms and legs tight enough to interfere with venous return, but not to obstruct arterial flow, ought, upon logical grounds, to do good; and I recommend you to make trial of it. In this way a large supply of blood may be kept off from the general circulation, and in a less hurtful way than by venesection; and for this purpose, such ligatures are recommended by Braun and others. I advise it for a different purpose, but, at the same time, recommend you to employ it for purposes of hemostasis if desirable.

By the artificial production of œdema, I think that benefit might very likely result from the fact that the serum infiltrated into the cellular tissue is loaded with urea, and thus the blood is to a certain extent deprived of its dangerous properties. I have resorted to this means in one case, but I saw no good result from it there. In warding off death by these approaches, do not forget that exhaustion may destroy life, and always support the strength by fluid food or enemata.

Sometimes, in the convulsions occurring after delivery, opium in full dose is found highly useful, but its use at all times, in these cases, requires great caution.

You may be struck by the fact that I recommend, in enumerating remedial measures, only very prominent and important ones, and leave many others which are ordinarily advised, as, for instance, asafoetida, valerian, camphor, the use of sinapisms, cold effusion, &c., &c., unmentioned. My reason for this is the belief that, ordinarily, perfect quiet, silence, and absence of light are more important adjvants than they, and that the physician should studiously avoid disturbing his patient by doubtful means. Some years ago, to demonstrate the importance of such quietude, I immersed a number of half-grown frogs in a jar of water which contained strychnia. They were, after a little while, seized with violent convulsions, and removing them, I placed them in the presence of the class, under a bell jar. As long as all was quiet, the little animals were free from spasms, and seemed instinctively to be keeping very still; but no sooner did I tap upon the glass or remove it and blow very gently upon them, than they would be violently and repeatedly convulsed. I once heard Dr. Marshall Hall say, that having poisoned a young terrier with this drug, he could smooth his hair down without causing spasms, but every time that he passed his hand in a contrary direction and rubbed the hair upward, convulsions would take place. This he addressed to a house-physician at one of the hospitals in this city, who was at the time applying mustard and friction to a patient who was suffering from uræmic convulsions. Bear it in mind when you are prompted to harass and annoy your patients with the hope of removing the tendency to coma by revulsive means. There are, however, circumstances in which these means may be indicated. In concluding, let me, with the hope of leaving a complete picture on your minds, place before you a synopsis of the treatment of puerperal convulsions:

- 1st. Bring the patient fully under the influence of chloroform.
- 2d. *If the indications demand it*, practice venesection.
- 3d. If labor has commenced, hasten it. If it has not, endeavor to

avoid the necessity of inducing it; but if you cannot, do not hesitate too long about its accomplishment.

4th. Act freely on the bowels and skin; apply cold to the head; give lemonade freely, if the patient can swallow; apply ligatures around the members, and support strength by nutritive fluid food or enemata.

5th. Bear in mind that the prolonged use of chloroform is not near so likely to kill as a return of the convulsions is.

On Paralytic and Convulsive Diseases of the Cerebro-Spinal System, including Epilepsy, its Physiology, Pathology, and Treatment. By H. P. DEWEES, M.D., New York.

(Continued from page 265.)

From what has been necessarily so hastily said, it is easy to perceive how narrow are the boundaries which are assumed, and how insensibly they merge into each other, as to the medulla oblongata or the brain being the originating seat of epilepsy. But it is well for practical purposes to remember that the spasms, for the most part, occur in those muscles deriving their innervation from the nerves of the medulla oblongata, viz.: the facial, the accessory, the hypoglossal, and the third branches of the fifth. It is also convenient to recall that for the most part the functions of the medulla oblongata are bilateral, corresponding to the muscular exhibitions in true epilepsy.

But there are seizures with epileptiform convulsions which, at their first incurrence, render the diagnosis between them and true epilepsy somewhat difficult. A stout, plethoric man may be suddenly struck down, and by the time the by-standers have summoned medical aid, he may be found epileptically convulsed, and insensible. There is both stertor and foaming at the mouth, but the respiration, although labored, is yet freer, and more regular, than in true epilepsy. The pulse varies, but it is rarely slow and hammer-like to the touch. The mouth, instead of being bilaterally acted on, is drawn more to one side than the other, whilst the facial muscles, in the intervals of spasm, appear unequally relaxed. The coming-to is longer than in uncomplicated epilepsy; the mind is more sluggish, and the voluntary transmissions, either for motion or speech, are impaired or imperfect. The arm and leg of one side become inactive, the speech is thick, indistinct, or confusedly labored. These and other paralytic conditions point to the brain as being the chief seat of lesion, although from some cause there may have existed at the time irritability of the medulla ob-

longata, which has been called into active participation by irritative lesion of the conducting fibres. Cerebral hæmorrhagic laceration has been found in some of these cases, and accounts for the symptoms which progressively occur. At intervals, other attacks ensue; and although insensibility may be the earliest symptom in a particular case, yet in others the spasmodic actions first evince themselves. These varying resultants depend as much on the situation of the hæmorrhage as on the quantity and rapidity of the effusion. I have known the pressure so gradually made, that the patient has stated he felt drowsy, and whilst apparently asleep, the stertorous respiration of apoplexy would ensue, quickly followed by the head being drawn rigidly to one side, whilst convulsive movements pervaded the extremities, and sometimes the trunk. At every renewal of the hæmorrhage the same symptoms are repeated.

During the reparative processes in these epileptiform apoplexies, insensibility may not again occur; but from the contraction of the clot, and other efforts towards cicatrization or repair, spasmodic twitching or convulsions of the facial muscles especially, may recur. The spasms are in most cases unilateral, and on the side opposite to the cerebral injury; thus, in the very beginning, the convulsions are epileptiform, but not epileptic. The post-objective appearances also differ from those of true epilepsy. On opening the mouth, the whole palate may sometimes be seen to be so relaxed as to fall on to the tongue, or one side only droops, with the uvula horizontally retracted. The constrictors of the pharynx are sometimes paralyzed, and the food, collecting in the pouches at the base of the tongue, becomes a source of intense misery, from the liability of portions to fall into the opening of the glottis on raising the head, thus inducing suffocative efforts for their dislodgment.

The accessory nerves of Willis, which act on the muscles of the larynx, and on the constrictors of the pharynx, together with the palatine ramifications of the second branch of the fifth, appear to be chiefly affected. Nor is it uncommon to find the œsophagus in the reverse conditions of contraction or dilatation; these structural differences depending upon the local nervous conditions of irritation, or of paralysis. A more immediately dangerous condition exists from the incurrence of œdema of the glottis. In one patient this was a rapid cause of death, whilst the difficulties from the paralytic retention of portions of the food, and its delay of transit through the œsophagus, existed in a most pitiable degree.

The after-effects of an epileptic attack in some patients require

discrimination. In many there are no prominent sequelæ, but in others simulative disorders arise. Deglutition, both voluntary and reflex, may continue difficult. The lungs may assume a pneumonic, bronchitic, or asthmatic state. The stomach may reject its nourishment, or refuse to digest. The heart may be deranged in its rhythm or sounds. The diaphragm may be acted on through direct irritation, producing explosive cough, hiccup, sighing, or anhelation. The abdomen may shrink from the slightest touch, as in inflammatory invasion. The kidneys and bladder may pour out their irritating contents, scalding the urethra in its passage, or complete suppression may ensue. The urine may become albuminous, and deficient in extractive matter, or it may be loaded with lithates, purpurates, and other materials arising from the surcharge of animalized decomposition, or from the insufficiency of function in other organs. These conditions, although for the most part transitory in their excess, yet are to be carefully examined into, inasmuch that they may serve to point out some latent difficulty, which has stealthily induced morbid states of nutrition in the nervous centres implicated in the phenomena of the epilepsy itself. The variety of remedies which have proved successful in different cases indicate the truth of the above assumption, and inculcate the doctrine that, although the nervous phenomena of the fit itself have their starting-point in certain regional bounds, yet the origin of the disturbances in the normal nutritive actions of these districts must be for the most part searched for elsewhere. For the structural changes which ensue during the epileptic condition are not peculiar to that disorder alone; they occur in other disorders as well.

In chronic epilepsy, the intellectual faculties are prone to become weakened and changed. Perception and volition, the simplest conditions of mind, become enfeebled or vitiated. Irritability passes into more or less continued excitement, which, after a time, may assume at first the form of temporary mania, again to be tempered down to partial imbecility or complete idiocy, or to be increased into hopeless lunacy. In some, there is intermittence, but no respite. The epileptic expenditure may exhaust the frame and restrain the maniacal manifestations for a varying interval, but to recur in new force, till death takes place.

Statistical records show that four-fifths of epileptics become subject to more or less mental alienation. Dementia is more frequent than mania. As might be supposed from the vast amount of morbid action discovered in the brains of the epileptic, monomania rarely occurs.

But it is to be remembered that the monomaniacal may become subsequently epileptic.

As before mentioned, the causes of epilepsy are various; but from the instinctive passions, none so frequently conduce to its incurrence as the venereal, when indulged in to relative excess. It is an instance of the infringement of the law already cited, viz., the correlation existing between the central and centripetal nervous actions, independently of nutritive disturbances. Irritation or injury of the cerebellum is frequently attended with derangement of the genito-urinary system; whilst the disorders of the sexual organs, and especially when arising from overindulgence, usher in qualificative alterations of nutrition and function of the basilar contents within the occiput. The recognition of these neural reciprocities is highly important, both in a diagnostic and in a therapeutical point of view.

The necro-statistics of epilepsy are generally unsatisfactory. The intercurrent morbid changes of the complications have not been satisfactorily distinguished from the pathologic essentiality. Post-mortem changes have not been rigorously separated from the nutritive alterations happening during life, and which were either causes or the sequences of the attacks. Reparative processes ensuing during the retraction of the disorder, or perhaps long anterior or subsequent to the epileptic phenomena, have been frequently set down as elemental departures from normal structure; whilst the true morbid sources have not been compared in their various stages with the symptoms in their periods of manifestation.

The localization of the originating causes of epilepsy has ever been a matter of dispute, and will continue to be, so long as the phenomena are mistaken for the existing causes. Wenzel regarded the pituitary body as being the chief pathologic seat; yet I have in more than one instance seen this body greatly diseased without any epileptic tendency, but in none without great derangement of the general nutrition. In two cases there was unbearable ophthalmic neuralgia, with distortion of the eye, apparently confirming the statements of Littre and Lieutaud that some of the branches of the fifth and sixth pairs of nerves penetrate this body, but which have not been demonstrated by other anatomists.

In one case the emaciation was extreme, although nourishment was taken in large quantities. Involuntary spasms affected the face, tongue, neck, and shoulders, but unattended by loss of consciousness. The spasms may be termed epileptiform, but not epileptic, as previously remarked when speaking of the unilateral facial spasms during cerebral

hæmorrhage. Had irritability of the medulla oblongata existed at the time, there might have been excited a true epileptic seizure, with cerebral unconsciousness.

Hereditary transmission has been statistically proved to exist in about one-third of the individuals affected; a proportion much greater than can be traced from any other one cause. But in what the essential nature of this transmission consists, whether in deviation of the structural or dynamic conditions of the ultimate cell, in which a specific so-called "taint" is engrafted, or in some elemental changes in the nervous structures themselves, or in local hypertrophies reproduced in the offspring, or in certain radical alteration in the constituents of the blood, sufficient data have not yet been collected to justify the adoption of any one in preference to another.

From my own observation, the children of the scrofulo-tuberculous are more prone to epilepsy, other things being equal, than are those in whom no such dyscrasia exists. The causes of this epileptic tendency arise chiefly from certain regional development of tuberculous matter within the brain, whereby its irritation or an exalted sensibility of the medulla oblongata is established, and from the erethism of the general nervous system, so commonly the attendant of this peculiar diathesis. Indications of tubercle, in the pulmonary tissues especially, are found in many in whom the epilepsy has been more or less chronic. Their original incurrence, or their development as sequential to the strain on the lung during the fits, must be diagnosticated on examination of the cases. The irritative or convulsive cough, with more or less bronchitic râles, especially in children who are growing rapidly and retain an outline of comparative vigor, should not lead into an erroneous belief of the lungs being primarily affected. These bronchial conditions, in very many cases, proceed from an exalted sensibility of the respiratory centres, and yield more rapidly to derivatories at the upper cervical portion of the spine, than to pectoral syrups. In some, smart slapping on the neck and shoulders relieves the convulsive coughing and shortness of breath. If, after a time, the irritability of the medulla oblongata increases, cerebral disturbances from the suffocative or long-continued coughing ensue, and the child, complaining of vertigo, becomes suddenly unconscious, and is attacked with the convulsions of epilepsy. The same frequently occurs in persons of more advanced age, who, from frequent masturbation or excessive sexual indulgence, have impaired the general nervous system, as well as excited an erethism of certain central districts. From the recovery attending many cases of so-called pulmonary consumption

under my charge, in whom the central nervous causes were early recognized, I can attest to the soundness of the pathological statements just offered, as to the pulmonary sequences without epileptic disorder.

The period for the exhibition of these hereditary influences lies chiefly between the first and the twentieth year. And this predisposition has some curious features. The child may be attacked before either the mother or father has exhibited at the time any epileptic tendency, of which I have seen several instances. Although excesses in venery or masturbation, and the changes incident to the period of menstrual decline, have been stereotyped as the most efficient productive causes, yet, when viewed apart from the coincidental or sequential regional derangement of the medulla oblongata, they form less frequent conditions than supposed. Vast excesses or severe menstrual difficulties are daily occurring without any noticeable convulsive disorder. But when from any cause the neuro-relations of the medulla oblongata, or of the districts behind or before the thalami, are disturbed, then epileptic, cataleptic, or other departures involving the normal reciprocations between the cerebral and spinal functions may be engendered. In the old, the very changes incident to their age may produce epilepsy, (with more or less paralysis,) since ossification, obliteration, or dilatation of either the great or small arteries may become an inductive cause, through passive hyperæmia or local anæmia, as may be relatively induced. Scholars both young and old, the overworked, the anæmic or the plethoric, may alike be attacked, as the brain or the medulla oblongata may suffer together or correlatively. In the young, paralysis and idiocy threaten as subsequent events. In the aged, dementia, mania, or imbecility, with creeping palsy, closes the scene of all useful life.

Both the centric and eccentric causes of epilepsy have been studied by various authors. Marshall Hall early taught that the convulsions of apoplexy and of epilepsy were due to the venous congestions resulting from the pressure on the large vessels by the cervical muscles. Kussmaul and Tenner, in their admirable essay, make issue with these doctrines, by experimentally inducing through compression of the great cerebral arteries an opposite state of the brain, by which an anæmic condition of the brain is induced, resulting in convulsions in every way resembling those of epilepsy. They consider that, by thus cutting off the supply of blood to the brain, and especially to the medulla oblongata, the active nutrition of these parts is interrupted, and thereby certain material changes ensue, productive of convulsions. On slicing away the cerebrum and the thalami, and then renewing the pressure on the arterial vessels, convulsions immediately occurred, thereby in-

dicating the medulla oblongata as the radiating centre. They conclude from their experiments that the central seat of epileptic convulsions is to be sought for in the excitable districts of the brain lying behind the thalami optici; and that anæmia of those parts of the brain situated before the crura cerebri, produce unconsciousness and paralysis in the human being. If spasms should occur with these symptoms, some portion of the excitable district behind the thalami optici must likewise have undergone some change; whilst anæmia of the spinal cord, instead of convulsions, produces paralysis of the limbs, of the muscles of the trunk, and of respiration. Although mere spinal anæmia does not induce epileptic convulsions, as insisted on by Kussmaul and Tenner, yet this impoverished vascular condition must not be confounded with traumatic lesions of the cord, as experimentally proved by Brown-Séquard, where the epileptic seizures could be produced by peripheric irritation of the integuments of the face and neck on the same side of the injury.

Although Marshall Hall's theory is incorrect respecting the compression on the venous trunks being the exciting cause of the convulsions, yet it cannot be denied that the reactive effect from this condition may serve to induce a more violent and rapid manifestation, and especially if the medulla oblongata had been in a previously irritable state. This differs, however, from laryngismus as an exciting cause; since, in this condition, the medulla oblongata is either primarily affected, or it is called into violent action by the exalted condition of the peripheric excitor nerves of the larynx itself. Hence the suffocative conditions vary according to the persistence or power of the irritative cause. In some, fatal tetanoid epilepsy results, from the fixed condition of the respiratory muscles, inducing complete asphyxia. In others, the cause is less persistent, and there is no fixing of the muscles of the chest. The spasms are more distinct in their alteration of tension and relaxation, whilst their subsidence corresponds with the carbonization in the pulmonary and cerebral vessels. The effect is much the same as produced by etherization; reflex muscular actions ensue at first, but subside during the advancement of the anæsthetic influence.

The exciting causes of these central or eccentric phenomena are very various, and the conditions of the nervous centres deviate from mere molecular perturbation to absolute disorder in their nutrition. The eccentric epileptic originations are more apt to be attended with the premonitory aura, consciousness being less speedily lost (and sometimes not all) than in an attack from cerebral or central causes.

When the result of wounds on the fingers, wrists, feet, limbs, &c., the aura not unfrequently attends, and the attack may sometimes be delayed or stopped by ligaturing tightly just above the point of irritation, by which either the perturbatory influences are checked, or a venous condition of the part is produced. When the result of mere internal irritations, many epileptics will, from instinct or from accidental discovery, throw themselves violently against some body, by which pressure can be made, thereby impeding the nervous perturbations, or inducing local venosity. That epileptic seizures, attended or not by laryngeal spasms, are apparently induced by mere nervous changes, independently of alteration of the calibre of the nutrient vessels, is verified by the mode which may at times be effectively pursued in arresting the epileptic attack that would have otherwise ensued. By calling imperatively to the patient to resist, and to make forced inspiratory efforts, the perturbations conveyed to the brain and medulla oblongata are neutralized by those caused by the exercise of the will, and the spasms do not ensue. Equilibrium is thus established. Some patients can in this way resist, by the exercise of strong voluntary impulse, the full effect of the attack.

That these points of irritation, no matter where seated, should cause epileptic phenomena, it is necessary that two conditions should be established. The first is, coincident disorder of the medulla oblongata, and of certain cerebral districts already mentioned. The second is, that these points of irritation should convey the impression to other organs or centres correlated in function or innervation, and from thence to the focal regions at the base of the cranium.

After all consciousness has departed, when all perception of sensation has ceased, the convulsions of epilepsy continue unabated or increase, from the exalted capacity of the medulla oblongata for reflex actions.

An important addition to our knowledge of the pathology of epilepsy has recently been made by Prof. Schroeder Van der Kolk, who has verified, by his own minute dissections, the connections existing between the two sides of the medulla oblongata, whereby normal or morbid excitations of this part are distinguished by bilateral actions, thereby differing from the unilateral lesions of the spinal cord, and sometimes from the manifestations of injuries to the upper cerebral lobes. Hence, the early convulsions of epilepsy commence in bilateral movements of the face, tongue, and organs of respiration. The seat of these spasmodic actions lies in the ganglionic cells of the medulla oblongata, which, when irritated, excite the associated nervous filaments. The arterial supply of blood to these cells is even greater than

to the gray matter of the brain and of the spinal cord. The medulla oblongata becomes the focus of reflexion through the conducting fibres from the brain, from the spinal cord, and from the viscera and sexual organs, through the influence of the sympathetic on the spinal cord, through its nerves or its vascular reticulations. Although it may happen, in early epilepsy, that no appreciable organic change exists, yet, from the repeated congestions, an albuminous intercellular fluid is exuded, causing more or less induration, which may subsequently undergo softening or fatty degeneration. Dilatation of the arterial capillaries in the medulla oblongata, especially, has been found to accompany this state. These dilated vessels are found running chiefly in the region of the septum, corpora olivaria, and the roots of the hypoglossal and vagi nerves, the posterior half of the medulla oblongata appearing more hyperæmic than is normal.

A memorable distinction is drawn by Prof. Van der Kolk between those biting and those who do not bite their tongue. In the former, he usually discovered the capillary vessels wider in the corpora olivaria, and in the course of the hypoglossals; whilst in the latter, the vessels in the course of the vagi were dilated; and in these latter, from the greater disturbance of respiratory action, was induced a greater fatality during the fit. He also considers that epileptic dementia affords no proof of incurability, as it may result from the pressure exerted on the gray cerebral substance by the vascular distention, which may disappear after the cessation of the attacks. But it is different with the dementia following acute mania, as this depends on degeneration of the cortical substance, and is incurable. Attacks of unconsciousness, attended by little or no spasm, depress the mental powers more rapidly than attacks of convulsions without loss of consciousness.

Strong and unexpected impressions made on the senses have originated some of the most violent and irremediable epileptic attacks. Fright, grief, excessive joy, the immaterial influences from sudden or long-continued bright light upon the retina; of sound, and of mental conjurations, have produced every manifestation of the disease.

The traumatic causes of epilepsy, from injuries to the head, have been purposely omitted, as their consideration would occupy too much space for this paper. The only remark that I will venture here is, that these traumatic cases, as a general rule, partake more or less of the epileptiform character, and on post-mortem examination, the medulla oblongata and the irritable districts about the optic thalami are not found in the pathologic states as seen in uncomplicated epilepsy.

The relief that has been immediately and permanently gained by the surgical aid of the trephine or elevator, in some cases, also corroborates the statement, especially when these means have been employed before the mere functional derangement of the medulla oblongata has eventuated in its structural alteration.

The diagnosis of epilepsy from other convulsive disorders, implicating psychical or sensational manifestations, has been partially included in the delineations already made above, and will also be incidentally mentioned in the following portions of this paper, when speaking of treatment. The detection of spurious epilepsy affected by street impostors, or by army delinquents, criminals, and sympathy-craving individuals, can only be satisfactorily made by the scientific investigation of the subject, wherein the adoption of certain practical experiments on the reflex conditions of the nervous system afford the most reliable evidence, since they are unknown to, and beyond the control of, the suspected person. But even these reflex phenomena are to be carefully separated from the voluntary efforts of the experienced pretender, who either modifies by restraint or exaggerates by will the sought-for effects. In tetanoid epilepsy, where the muscular tension of the trunk and upper portion is very great, the dashing of cold water on the face or over the chest does not, at times, produce any noticeable reflex change, and the observer might wrongly conclude that the quivering or vibratory sustentation of the spasm was kept up by powerful voluntary act. I will also remark here, that sometimes this mode of treatment in these terrific cases may result in immediate relaxation, the nervous centres not being able to sustain the double action of the diseased exciting cause and of the peripheral excitation at the same time. But care is to be exercised, as cases have been reported in which the sudden dashing of cold water on the surface has proved almost immediately fatal, either by the sudden debility of the respiratory centres, or by their explosive increase of power, inducing an unyielding rigidity of the laryngeal and thoracic muscles.

As a general rule, however, the voluntary sustentation by the impostor is longer, provided he is surrounded by a wondering or sympathizing crowd, than the reflex spasmodic tension of the true patient. But it is well to remember that in both the same regional tracts are really brought into action—in one by voluntary engagement, but in the other by involuntary reflex action. The impostor has an object to attain: he selects a place suitable and somewhat comfortable for his imitations, and only accidentally endangers himself, and I believe

never bites his tongue; whilst the unfortunate epileptic falls anywhere, is unconscious of pain and danger, may bite his tongue, and evacuate the bowels or bladder, or vesiculæ seminales, and never runs away at the approach of any well-known medical man, who might, for experiment, light the clothes or straw on which he is lying.

A more difficult point of diagnosis lies in the interpretation of those cases wherein the incurrance of the disorder is unsuspected by the patient or his friends. Night-fits, especially, happen unnoticed by the sufferer, the sequelæ of which are complained of as original conditions, and may frequently be so treated by the medical attendant. Dullness of intellect, or irritability of temper, defective memory, stammering articulation, moral confusion, changes of habit and of affections, are frequently the early objects for professional consultation or observation, when the discovery is made, after a time, that the dread disorder of epilepsy had been latently existing, and had gained an impregnable foothold. Children, who sleep soundly, or others who sleep alone, may pass from slumber into epileptic sopor with rapid convulsion, and back into sleep again, without consciousness of the passage of the attack on waking, save a sensation of fatigue or of general malaise. Others merely notice a little blood on the pillow from the slightly-bitten tongue, but which is generally supposed to have come from the nose. Some cases of involuntary seminal emission, unattended, generally, by pleasurable dreams, are referrible to these latent epileptic manifestations. Our space forbids further attraction to these unsuspected cases of stealthy epilepsy, but enough has been said to render a more wary attention to many obscure cases of so-called ill health.

REMARKS ON TREATMENT.

From the antecedent portions of this paper, it must necessarily appear that as the causes and conditions leading to epilepsy are variable and very numerous, that no specific remedy or class of remedies can be relied on in regard to treatment, either as to eradication, or even amelioration. It has been shown that, although the paroxysms of epilepsy are generally exhibited by convulsions, or static disturbances of those parts receiving innervation from the medulla oblongata, either directly or indirectly, yet other phenomena besides those of muscular convulsions may ensue. In some, vertigo, with subsequent loss of consciousness, or with unconsciousness to every other condition, is substituted for the epileptic paroxysms, which appear merely to affect the larynx more or less, without implicating other special regional portions of the medulla oblongata. In some, indeed, the medulla ob-

longata, so far from being rendered excitable, seems to be temporarily paralyzed, and unable to sustain even the automatic actions so essential to life. Hence, in these cases, which appear to depend on some blood condition, either as regards its mechanical distribution from disease of the heart for instance, or its quality from some error of the organs of assimilation, the treatment must necessarily differ from those in whom no such condition exists, and in whom the phenomena vary. Epilepsy from disease of the basilar portions of the brain calls for a treatment differing from the attack induced by suppressed customary hæmorrhages, by abdominal tumors, or by reflected points of irritation in the genito-urinary organs, &c., &c. In one, epilepsy may result from causes purely nervous; in another, from disturbances purely vascular; whilst in a third, both nervous and vascular derangements may arise from a mechanical or accidental source.

Depravities of the blood, whether from kidney or liver disease, or other seccernent impairments, are frequent causes of epilepsy. These depravities cannot be eliminated, or rendered innocuous, by mere treatment addressed to the local centre of radiation; it must be more comprehensive. The indications of blood-poisoning must necessarily be various; and this diversity depends mainly on the amount and quality retained, on the affinitive conditions of the different organs, and on the states of the nervous centres at the incursion of the blood pollution. The phenomena vary according to the various groupal connections, and the special derangements of nutrition. Poisons internally developed do not differ as regards their selective affinity and manifestation from those externally administered. Some are generated by excess of nutritive supply; others by its deficiency, independently of any fault in the organism. And this proportion of nutritive supply is as frequently relative to the organic capacity of the individual, as to the amount ingested. Some organisms produce, by a peculiar vito-chemical action from moderate sources, the very agents so injuriously reactive in those who have habitually abused their powers of assimilation by excess of supply. The lithic condition, for instance, resulting from organic generation in the former, represents a like state of non-transformation in the latter. It is seen in the gout of the starver, as well as of the feeder. So in rheumatism, where both the lithic and lactic poisoning are exhibited. In one, a mere affection of the non-epithelial fibrous structures ensues, resulting in general disorder from some known or traceable cause, as cold, damp, and exposure; whilst in another, the epithelial tissues become invaded, their disorder not being traceable to any undue exciting outer cause, but indicating a

blood-dyscrasia from depraved secernent actions, with constitutional results more or less threatening to life, as well as impedimentary to motion.*

In toxæmia, not only do the symptoms vary, but the causes of collection in the blood differ. Uræmia, with defective or contracted kidney, from which qualitative retention of noxious salts, or non-elimination of urea with urinary decrease ensues, is very different from the condition of the system by which the blood is surcharged with the same poisons, from their overgeneration, whilst the watery excretion is normal as to quantity, and its specific gravity higher as to qualitative extraction. In one, hydropical effusions ensue; in the other, emaciation with an ex-serous condition of the cellular tissue attends. Both may be convulsed, and the convulsions may be epileptic, apoplectic, or local, according to the portions invaded and the nature of the changes induced. If within the hemispheres, and the changes are those from congestion, apoplectic coma may result; if from mere irritation, the functions of the brain may be exalted into delirium or mania; if from depression of the nervous centres, stupor or lethargy may obtain. The convulsive actions or the paralytic inertness will depend on the reciprocative condition of the medulla oblongata, and the conductive or non-conductive irritability of the medullary matter. In many, the uræmic symptoms are not prominent as deviations in the intellectual or automatic portions of the brain. They may arise from the intermediate regions, viz., the emotional. Hence, cataleptic, ecstatic, euthanastic states are impressed, at times without and sometimes with convulsion, the flexor or extensor tension being frequently confined to one limb, or to certain muscles in groupal co-ordination.

Yet, as regards treatment, these toxæmic cases differ essentially, and hence the necessity for exactness of diagnosis. Since in one, a disorganized kidney may exist, from which there is no power of recuperation; whilst in another, the eliminative organs are sound, and performing extra duty. The cause of death in the first really lies in the kidney; whilst in the second, it lies in some portion of the nervous or cell system.

The epilepsy of the anæmiated from sexual abuses differs greatly from that of the plethoric, in whom the venereal function is restrained. In one is established an erethism, which responds violently to any cause invoking the function of the medulla oblongata; whilst in the

* See my article on Rheumatism of the Epithelial and Non-Epithelial Tissues, in this Journal, vol. viii., 1857.

other, the power is overgenerated, and explodes, so to say, as a spontaneous mode of relief. In females, the derangement of the utero-ovarian function forms a like condition. In both the male and female, epilepsy may be the result of a mere functional derangement, or it may ensue upon certain organic changes, which, whilst they are mostly irreparable, yet can be rendered less injuriously excitant through appropriate treatment. Epilepsy from crethism of the vascular nerves, by which the cerebral circulation is interfered with, resembles that excited through the changes induced in the vessels of the brain by disease of the heart. In one, the excitement of the vessels themselves is great; in the other, the vessels are mere carriers or holders, according to the cardiac condition, by which either more blood is forced into the brain, thereby exalting its nutrition, or, by overdistending the chambers of the heart, a surcharged venoid condition is established, which depresses the nutritive energies, whilst the pressure is increased. The treatment required in the one case is opposite to that of the other.

In the epilepsies of children, especially when happening after the period of dentition, and in whom hereditariness cannot be traced, as regards either parents or grandparents having been subject to the disorder, it is imperatively necessary to inquire into any syphilitic disease having been incurred by the father or mother prior to the conception of these children. It is not uncommon to find eruptions, inguinal ulcerations, and follicular disease of the throat in the offspring of such parents, in whom no secondary affection has as yet manifested itself. The anti-syphilitic treatment relieves the condition of the child so afflicted, and is confirmatory of the origination, and as to the appearances of the parts affected. After a variable period, the parent may evidence the syphilitic taint by the various tegumentary eruptive disorders, or by nodes or cranial exostoses, or deep excavative ulceration of the glands and follicles of the posterior pharynx and larynx. As, in the parent, the affection yields according to the condition of the other organs, and of the local specific manifestation, to Hydrarg., bi-chlor.: Proto., iod. merc., or Pod. or Bromide potass., &c.; so, in the child, do the same remedies, judiciously administered, prove valuable in arresting the epileptic attacks.

In some cases of hysteria greatly resembling epilepsy, with uterine ulceration or erratic erosions of the cervix, I have been able in several cases to trace a syphilitic infection in the parent, and have, by cautiously administering the iodides and bromides of potash, &c., in conjunction with local treatment, been successful in removing the hysterical condition. The muscles which derive their nervous supply from

the medulla oblongata are, in the syphilitic cases of hysteria, brought into action more by the reflex irritation from the ulcerated or eroded portions of the posterior fauces, pharynx, and larynx, than by any specific central action. The cases are originally those of simple hysteria, aggravated by nervous conduction from the latent syphilitic conditions affecting the inner throat. They differ from cases of syphilitic epilepsy in these essential features: that in the latter, the primary inoculation of the virus originated in the individual, and not from an hereditary taint; that the syphilitic eventuations are elsewhere distinctly recognizable by nodal exostoses, alopecia, or eruptive, ulcerative conditions. The phenomena are also those of epilepsy, viz., the solitary cry, unconsciousness, insensitiveness, biting the tongue, disregard of danger, tetanic condition of the larynx, deficient respiration, turgid or blackened face from capillary rupture, involuntary passing of the bowels or bladder, &c., &c.; and are not those of hysteria happening in persons tainted through syphilitic parents. In these, the hysterical element is prominent, as exhibited in the repeated cries or sobs, emotional exclamations, unsubdued consciousness, watchfulness against injury of the tongue and person, globus, alternation of laughter and sobbing, and comparatively free respiration, with relaxed larynx, &c.

When the cranial bones, becoming affected by syphilis, give a fair ground of suspicion as to the cause of the epilepsy, the preparations of mercury, of iodine and mercury, iodide of potash, &c., conjoined with tonic remedies for the debilitated, will do more to effect a cure than any of the medicines vaunted as specifics. If the skull becomes thickened, independently of any venereal taint, and organic disease of the brain appears threatening from the various symptoms of paralysis, disturbed mental functions, neuralgic pains, &c., the long pericranial seton or issue should be resorted to, in conjunction with internal remedies. The neck seton, high up to the base of the skull, answers well in those cases where, besides an undue excitability of the medulla oblongata, there appears a hypertrophy or overgeneration of the ganglionic cells, by which a periodic discharge of nervous force is established. In some, the irritability appears at first to be increased; but, if the case be really suitable for the seton, this speedily diminishes as the suppuration increases.

In the anæmic, the seton fails of success. The drain is too exhausting, and local irritation is added to the nervous erethism. So far from becoming a point of divarication, it becomes a radiating cause of eccentric irritation. The ulterior effects, in such conditions of the system, are the same as happen in certain spinal diseases, in

which, besides the constitutional injury, a local exhaustive irritation is established by the worse than injudicious application of suppurative agents.

There are other cases, however, in which a suppurative drain relieves the fullness of the vessels, and appears as equally efficient for good as does the mechanical application, which relieves, in spinal disease, the crowding pressure of the vertebræ. When the blood is loaded with more or less impurity, a certain source of its elimination is established by opening a drain near the organ so greatly concerned in the phenomena of epilepsy. In local hypertrophy of the ganglionic cells, in which the amount of organic force and nutritive supply is in excess, a certain quantity will be expended in the wastage.

In some syphilitic tumors found pressing on or within the brain, the changes are seemingly effected in the same manner as when the ulna and tibial bones to all appearance become enlarged, as a result of syphilis. A fibrinous material is effused around the bone, and is attended with a hardness so great as to give rise to the idea of true ossific enlargement. The pain is tormenting, both night and day; and where the effusion is not great, or is so situated as to be covered by the muscles, and is detected with difficulty, the case is generally viewed as simply neuralgic. That the disorder is periosteal, and not a real increase of the bones, is readily discovered by the rapid subsidence of the enlargement under leeching, and the internal and external use of iodide of potassium. Such tumors I have seen emerging from the coverings of the brain, which is pressed on and progressively absorbed or condensed by the gradual encroachment. When examined, they are of a waxy, fibroid nature, without any appearance of cerebral texture. These tumors are indicated by the severe and continued neuralgic pains, the loss or exaggeration of function, either mental or motor, being subsequent to the physical or molecular alteration of the cerebral substance, which conduces either to the excitation or abnegation of power in the motor nerves below, since nutritive changes in the brain may eventuate in convulsive movements, as well as in paralysis. When such tumors are developed in situations by which the pons varolii is more or less encroached upon, neuralgia is a prominent symptom; the muscular symptoms being those of convulsion and paralysis, as referred to in the fore-part of this paper. Deafness in one or both ears, more or less varying, from time to time, as to the amount of hearing lost, is a not unfrequent attendant. The protoiodide of mercury and iodide of potassium are the sheet-anchors of treatment; whilst pustulation or a seton in the neck will act as a derivative, or as a source

for organic waste. As a matter of diagnosis in these cases, it must be remembered that the convulsions are not always epileptic; that is, they are not in the groupal muscles served by nerves from the medulla oblongata. They may merely affect the extremities, or one side only, without inducing general participation, whereby the larynx is more or less implicated. In place of convulsions, complete paraplegia, or of one leg, or hemiplegia, one-sided or crossed, may take place.

Epilepsy accompanied by nocturnal pains should always lead to the suspicion of syphilitic contamination. Iod. potassæ, with lactucarium, hyoseyamus, or conium, will be found most trustworthy.

In dilatation of the left ventricle, attended with thinning of the parietes and general cardiac asthenia, the nutrition of the brain is more or less interfered with, by the assimilation within its structures of the arterial blood to the venous. From such cardiac conditions, epilepsy is not an uncommon eventuation, and is frequently termed cerebral, when in reality it is the result of a disabled heart. In these states cure is impossible, but the treatment for temporary relief is at times practicable, although difficult to be decided on. When highly-carbonized blood circulates, or rather is delayed in the brain from such causes, it becomes highly important to know how long such a state can be safely borne, and if the spasms can be relaxed within a given time. Hence the propriety for the administration of chloroform depends on its power, in a certain case, to relax the spasmodic closure of the glottis, by which oxygenation may be re-established, or on its acting as a paralyzing agent over the peripheric and central respiratory functions. Without regard being paid to this latter contingency, the remedy at times so efficacious in the first condition would in the second become dangerous, by increasing the venoid stasis within the brain.

In the poor-blooded, debilitating passions are apt to be of more frequent occurrence than in the plethoric. As a general rule, they are more prone to voluntary and involuntary losses of semen; and if addicted to the saturating abuse of alcohol, opium, or tobacco, or if affected with anæmia, they are more liable to epilepsy than are those of more robust physical endowment. And the treatment in the one is less difficult than in the other, inasmuch as the organic constitution of the blood itself, in the rich-blooded, is not degraded, and does not require the additional medication for its reconstruction.

It is highly important to discriminate between the alterations of the brain-substance, inducing the epileptic attack, and the causes work-

ing such a deviation in the normal nutrition of the brain. The poison of syphilis in itself, for instance, does not excite the spasms, but the specific alterations of structural nutrition ensuing from its incubation induce the phenomena of the attack, which also in its turn may give rise to certain demonstrable local disorders, eventuating in an aggravation of the convulsions, or in a paralytic or maniacal condition, according to the situation. The treatment, therefore, in such cases, whilst it recognizes the proximate syphilitic entity, and is so directed as to destroy its specific action over the normal nutrition yet has to include such remedies as may possess the power of retarding the conduction for spasmodic action, and of reducing the quantity or quality of the fluids effused during the convulsive strainings. After the extinction of the syphilitic contamination, the normal type of the structures invaded may be reproduced, in preference to the anomalous modifications, which were renewed during the specific toxæmia.

The extra-cranial causes of epilepsy, such as cicatrices of the skin, or even of the cord itself, irritations from foreign bodies in the nerves, as from glass, thorns, needle-points, &c., or neuromas, or irritable districts in the mucous membrane, utero-ovarian derangements, &c., are to be searched for; and the knife, caustics, cathartics, emmenagogues, and the like, are to be resorted to. Both tardy and too profuse or frequent menstruation are sometimes premonitory exciting conditions: one by the hyperæmia and uneliminated material; the other by the nervo-vascular excitement and anæmia. The treatment in these states has to be specially directed; antiperiodic remedies, such as quinine, chinoidine, beberine, and arsenic being conjoined or employed externally with those addressed to the disordered function. And this disordered function has to be redressed, either by overcoming the local condition which imperils the general system, with epilepsy as its indication, or through the general system which effects the reactive derangement of special function.

In many cases there are no apparent conditions, as tubercles, or other morbid growths or alterations in the brain; but the proximate cause seems to lie in some derangement of the nervous centres themselves, which excites the paroxysms. Psychical changes, suddenly induced by fright, repelling sights, or imitative impressions, produce certain physical or molecular alterations of the central ganglionic cells, through which contraction or dilatation of the minute vessels ensue, giving rise to loss of consciousness, sensibility, and to convulsions. In the generality of such cases, the conditions are those of anæmia, and hence require the judicious selection of the preparations of

iron, zinc, and silver, combined with a nervo-stimulant or sedative, as valerianic, phosphoric, or hydrocyanic acid, in conjunction with a special tonic, as may be indicated. But remedial treatment is valueless, unless associated with rigid moral training. Exclusion from the special and all-exciting causes must be rigorously enforced, whilst the will of the patient should be perseveringly educated to oppose the effect of the sudden changes in the nervous centres, by instituting another and more powerful impression of resistance in the same centres or in others antagonistic to them. When glottal closure ensues, leading to almost complete suffocation, the application of a sol. of nit. arg., 40 to 60 grs. to the ounce, will be found of great benefit. If any warning is given before insensibility attends, the determined order by any one for the patient to take his breath, or the patient's self-determination, will produce most marked results. If there be much arterial throbbing, direct pressure should be made over the carotids, *avoiding compression of the jugular veins*. During the intervals between the attacks, air and non-exhaustive exercise, and the cautious use of the shower-bath, should be advised; the water being at first just below the temperature of the body, as otherwise the shock would induce a state similar to the one exciting the epileptic seizure. After a few trials, the temperature of the water can be gradually lowered. In conjunction with this, the patient must be subjected to self-moral training, the tonic remedies being cautiously administered. In the very fair-skinned, whose faces redden or pale easily by any emotional act, the preparations of iron, if given in even moderate doses, excite a certain crethism, which increases the susceptibility to every emotion to vascular changes from the increased nervous impressibility which is apt to be excited. Zinc and silver act more favorably; and as the appetite and capacity to bear food in greater quantities are generally increased by them, the blood recovers its normal composition. If it does not, then a grain of lactate or phosphate of iron can be mingled with the food, to be gradually increased as may be borne or required. The susceptibility of the mind must be changed by such studies, conversations, and employments of a sound practical nature as will tend to fortify the centres against emotional excitation.

In these cases is seen the same condition of the emotional tract as found in previously strong-minded persons who have suffered from depressing illness or from debilitating losses of blood, viz., the complete powerlessness of the intellectual centres, with uncontrolled action of the emotional. This happens not from any sudden access of strength in those portions presiding over these manifestations, but from the com-

plete inability of the reasoning powers to govern them. When this emotional erethism is fairly established, habit is engendered. In other words, the nutrition being changed from the normal condition to the anormal, the function becomes anormal instead of normal. Hence dreams, fanciful reveries, sudden emotional excitement, or even reflex impressions from touch during sleep, or absence of mind, may cause an attack of convulsions. Now these very cases, from the irritability of the basilar brain portions, are very apt to indulge in erratic feeling and actions, and to impair their general system by venereal excesses, or by secret vices. Hence, it may become essential to conjoin those remedies which apparently exercise a controlling power over the venereal functions, such as the infusion dulcamara, hyd. potass., camphor, bromide of potash, &c. But whilst directing attention to the fact of this condition, a warning is also to be inculcated, viz., to be certain that such erratic mania exists before administering any so-called anaphrodisiacs, since when absent (and in many, complete inappetency exists,) the very state suspected may be alarmingly excited, as known to me in several instances. It is readily comprehended from this fact, that no remedy is specific in regard to its phrodisiac virtue, this condition being a result of a relative physical state induced.

As a general rule, during the attack, even when practicable, the administration of narcotics is valueless, and such also is the result of their trial during the interval. But there are conditions in some cases in which the epileptic seizures are sequential to certain premonitory phenomena, that narcotics or anæsthetics prove valuable. In some neuralgia precedes the attack, and if this can be arrested, the convulsions are not excited. Hence both narcotic remedies or even local stimulants of rapid action, and anæsthetics are to be employed. I have known the application of diluted ess. ol. sinap. or Granville's lotion over the appropriate regions stave off a paroxysm, even when not premonished by neuralgia. By the reflected action from the surface on the centres, an impression (molecular change) is made, which is more powerful than the one from the disorder, independent of the peculiar nature of that change. But in central epilepsy, where the medulla oblongata is especially the radiating point, peripheric stimulation is injurious, inasmuch as its function is *overexcited, and thereby more blood is invited to it by the distal irritation*, and that blood being at the time poisoned, as regards the normal assimilation of that great centre. This effect of irritants applied to the surface is readily seen in hæmorrhagic effusion, from concussion especially, where the medulla oblongata or pons varolii is more or less impinged on by the pressure of the condensed

brain, whilst the vascular condition is proportionately increased. By applying mustard or ammonia, &c., to the extremities, reflex movements ensue, and frequently add to the mischief of the case by the exhaustion attending the violence of the motions.

Even injections of mucilaginous materials are responded to in these cases by spasms of some portion of the body, the manipulations necessary to their administration aiding not only in the excitement of the reflex movements, but also in fatiguing the patient. If the respiration be easy in the position assumed, *no attempt at movement of the head* should be made, as fatal consequences may suddenly ensue, as is so frequently seen in cases of fracture of the upper vertebræ. The bladder, in these cases of epileptiform convulsions from effusion of blood, (and sometimes even from serous collection,) is apt to become greatly distended; and although its expulsion is restricted, yet the distention is sometimes sufficient to arouse reflex spasms, whilst the ureters filling, the kidneys become irritated and congested by the reflux of their secretion. The bladder can in almost every case be felt enormously enlarged above the pubes, and the withdrawal of the water in these cases is all-important. But the bladder should not be suddenly emptied, as in some it acts almost as fatally as a blow upon the stomach, or after sudden evacuation of ventral fluid.

In all cases of epilepsy, it is important to inquire into the previous state of the urinary apparatus, since in many renal disorder is either an attendant or precursor; and where there is reason to suspect the forms of Bright's disease, or other conditions rendering the renal functions more or less inoperative, it is not to be forgotten that a large amount of animalized matter is thrown into the blood from the exhaustion of the tissues by the spasms themselves. In some a tetanoid affection is induced by toxic condition of the blood. Generally, peripheral irritation causes no reflex spasms in these cases. The tetanoid spasm arises from central poisoning of the portions chiefly deranged in the original attack. When the immediate spasmodic conditions have been subdued, the intervals may be occupied by an apparent rheumatic condition of the spinal region or of the extremities; but it is really a disordered membranous and neural nutrition from the poisoning of the blood, not only by the retention of urea, but of other animalized excretion, rendered unfit for further uses of the organism. The treatment by sudorifics, hot-air baths, proportionate exercise, regimen, and the *stimulation of the compensatory functions*, must be supplied from the hints already given.

Cutaneous repressions are in many cases followed by epileptic

exhibitions. Their appearance is not unfrequently significant of some irritation of the nervous centres themselves. This irritation may arise from toxæmia, induced by a derangement of elimination in some organ, by a plusage of supply to the blood from without, or by super-organic action of the secernent functions. At all events, the sudden suppression of the eruptions, by any topical treatment especially, is injurious and dangerous. The treatment must divide itself according to the constitutional condition. The cutaneous disorder is a mere topical product, frequently arising from a central disturbance, or from a blood condition interfering with the normal nutrition of the distal or of the peripheric portions, and is not an independent process through which the blood is contaminated, and the nutrition of the centres degraded. The direct treatment consists in endeavoring to reproduce the eruption which has been repelled, and in the employment of such sedatives or stimulants that may arrest, or restore if deficient, the central nervous irritability, and of such alteratives which may specifically change the blood composition and induce the normal status of the organs affected. The eczema of the habitually intemperate points as much to the disturbed central conditions of the cerebellum and medulla, as to the blood depravity from depraved secernent action. If the eruption is suddenly repelled in these inebriates, a fatal issue is not uncommonly induced or premonished by epileptic or epileptiform convulsions, with paralysis from cerebral causes. The hemiplegia of the drunkard, which causes the paralyzed arm to droop forward and to be apparently lengthened by the relaxation of the pectoral muscles, and the leg to drag the pointing toe wearily along the ground, is not only ushered in by convulsions, but is apt, if not fatal at first, to be attended with their constant returns; whilst uræmia, with its dropsical heart and chest, and puffy, tallowy face, or cholæmia, with its ascetic belly and shrunken, tawny skin, evidences the vast organic changes in the kidney or liver.

In all skin diseases with uræmic and cholæmic pollution, and even where no such conditions apparently attend, attention should be directed to the condition of innervation of the basilar portions of the skull. Causes which act on these portions, by which the circulation is impeded, are apt to induce congestions of the pulmonary vessels, attended more with the physical manifestations of transudation, than of exudation, which is an organic process. Hence hydrothorax and œdema, &c., are more frequent than pneumonia and pleurisy. In the inebriate a tardy decomposition of tissue attends the alcoholic absorption. In these the organic processes are more exhausted by their efforts of

transformation than of conformation, and these transformations are more of accommodation than of repair.

The term enteric epilepsy may be used in contradistinction to cerebral or central epilepsy. The radiating points are somewhere within the intestinal canal, the participation of the medulla oblongata or of the superior irritable districts being established by preceding irritability, or by some trophic irregularity. These points of reflex irritation may be in themselves direct lesions, or they may be established by abnormal growths, by worms, by acrid ingesta or secretions, &c. The remedial measures are to be selected according to their specific or alterative action: Nit. or oxide of silver, hydrocyanic acid, oxide, phosphate or valerianate of zinc, turpentine, croton oil, belladonna, opium, valerian, alterative prep. of mercury, of muriate of ammonia, &c. Sometimes an impacted gall-stone, by its reflex action, lies at the root of the epileptic evil, and the potash, opiate, and turpentine, and the sweet oil treatment, which insures the dislodgment of the biliary calculus, relieves the convulsive tendency. The same may ensue from the irritation by intestinal congestions, either crystalline or faecal. The latter may be merely local, or the colon may become impacted in its distensive pouches, which may, however, allow the partial passage of faecal matter, or even give rise, by frequent watery, slimy dejections, to the opinion of chronic diarrhoea. Together with eccoprotic measures, these latter cases are relieved by the injection of a sol. of bicarb. soda through the O'Beirne tube, which not only partially dissolves the accumulated masses and scybalæ, but induces a free discharge of bile from the liver. Epilepsies of this kind have arisen from the frequent and incautious use of charcoal and magnesia, which have collected in hard boluses, and tended to give supply for the formation of the magnesian concretions sometimes lodged in the intestines. It is in these enteric epilepsies that the internal administration of chloroform will be found so beneficial. Kidney complications have already been referred to, but independent of albumen, lithic conditions of decrease or increase, with or without renal calculi or sand, oxaluria, &c.; another condition of urine may exist which indicates not only uræmia, by which the centres are poisoned, but also a state of constitutional disassimilation or disintegration, by which the whole cerebro-spinal nervous system is exhausted. This condition is indicated by phosphatic urine, with deficiency of urea. Besides out-door exposure, which must not be accompanied by muscular fatigue, or by the indulgence of sexual excitement, (if the power be not already lost,) the nitro-muriatic acid bath, and its internal use, forms a valuable adjuvant. Where the exhaustion is great,

quinia, with phos. zinc., is indicated. As in this disorder the red blood-corpuscles rapidly diminish, and there exists a proportionate increase of the white, attended with defective respiration, an elegant and serviceable preparation will be found in the *elix. calisaya et ferri phosphorat.*

Albuminuria is not an unfrequent attendant in convulsive diseases; but mere albuminous urine should not be viewed as indicative of certain renal changes, since oftentimes it is found in urine having no deficiency of extractive salts, or of normal specific gravity. In many cases, the albuminuria is a condition of compensation. It mostly exists in undeveloped scrofulosis, and when the albumen is accidentally stopped or interfered with, its arrest becomes coincidental with tuberculous development elsewhere. And the same albuminuria of excess sometimes ensues in scrofulosis on arresting or healing up of old sores, the excess being compensative, and not destructive. These states result more frequently in scrofulosis of the syphilitic than where the taint is absent. The gauge for treatment depends on the quantitative analysis of the urine. If the extractive salts are normal in quantity, it will not be found safe to interfere with the albuminous contingent. Air and proportional exercise, and surface depuration, are the only remedies, unless syphilosis exists, the regimen being strictly followed that has been found to agree, by the patient's own experience, which affords the best mode of analysis. It will be only necessary to remember in case of violent convulsion in those states, epileptic or not, that the exhaustion following violent and long-continued exertions (voluntary or involuntary) are apt to induce cerebral congestion and effusion, with their sequential accompaniments.

In the trismus attending epilepsy, opiate enemata or local hypodermic injections are sometimes advisable, the latter being found most serviceable in enteric radiation. But locked-jaw in epilepsy may give place to the fixed open jaw. This result indicates no difference in the essential nature of the disease; it is merely a variation of groupal action. There is one distinguishing symptom as regards the jaw between hysteria and epilepsy. In the latter, the teeth never chatter.

The ancient Scots castrated their epileptics as a matter of cure; it has of late days been attempted, and sometimes successfully, when the eccentric cause laid in the testes; as a means of arresting its propagation in offspring, it certainly forms, when complete excision is made, a most effectual remedy. Some years ago, whilst in a city of another State, I was consulted by the owner of several whaling ships relative to a man about 32 years of age, who was regularly seized with epileptic mania when about thirty days out at sea. Learning that this

man when on shore was erotic to a great degree, and that otherwise he was well behaving and always enjoyed his health, excepting a severe pain in his left testis, I gave it a rough opinion, that the fits at sea, when apart from women, were probably owing to reflex irritation from the testicle upon the cerebellum and medulla. On his return from the voyage, during which he was constantly seized with epileptic convulsions, and violent but temporary mania, he heard of my opinion, and sought in a neighboring town the advice of a very skillful surgeon, who relieved him of the diseased testis. From that time to the time I last heard of him, about three years, he had enjoyed perfect health, without return of the symptoms. But in central epilepsy, with *subsequently* diseased testicle, no such favorable result could be predicted, unless the exalted sensibility of the testis propagated through its nervous relations fresh organic changes, attended with vascular dilatation in the medulla oblongata, thereby hypertrophizing the ganglionic cells, and rendering them more liable to surcharge.

As a rule in epilepsy, the torpid cannot be treated like the nervous and irritable; nor do remedies having control over the male act similarly over the female, since amenorrhœa, uterine ulceration, and leucorrhœa, or prolapsus and other displacements, affect the epileptic female in a special manner, the mere regulation of womb difficulties frequently insuring a cure.

From its peculiar action in diminishing the red blood-corpuscles, belladonna offers in the plethoric to form a valuable remedy, independently of its action over the sympathetic nerve, as also does digitalis in over-excitation of the heart, and especially when, from hypertrophic dilatation, the brain evidences a maniacal tendency. In anæmia with nervous crethism, inducing frequent, short attacks of epilepsy, the hydrocyanate of iron, steadily persisted in, induces the return of red corpuscles, whilst the nervous susceptibility is kept soothed. By many of the older practitioners indigo was esteemed as almost specific in the treatment of epilepsy. It acts more favorably on females, in whom some uterine derangement exists with the epilepsy.

Both the oxide and phosphate of zinc are valuable alterative tonics; their employment is indicated in the anæmic and brain-wearied. In the plethoric they do not serve well. The valerianate of atropia has been recommended by high authority, in the dose of 120th of a grain. Atropine by injection has also been recommended; as yet, I cannot offer an opinion as to their adaptability, but should not recommend their use in the anæmiated, or those with heart complications. If given to the rather plethoric, and the fits are reduced considerably in interval,

one caution must be observed, lest an accumulation of force through apparent hypertrophy of the ganglionic cells should ensue, and prove fatal by the violence of the convulsions. Where this is dreaded, the seton should be employed as an exhaustive drain, and such exercise continuously but moderately enjoined as will tend to discharge a certain amount of power.

In conclusion, I will state that in eccentric epilepsy, where the glottal spasm is one of the first symptoms, I have been satisfied with the results of the application of the sol. nit. silver to the larynx, followed by a solution in glycerine of quinia as a local antiperiodic, and with the rubbing in of a strong sol. quinia in the spine after the irritation, by *ess. ol. sinapis dilut.* Arsenical solution, internally administered, (and sometimes by injection per rectum, in a mucilaginous vehicle,) is also restrictive of the periodicity of the attacks. Arsenic appears to act through the peculiar influence it exercises over the rapid arrest of the albuminous tissues, and probably through its power of constricting the capillaries and minute arterial terminals. This influence is sometimes exercised over the matrix supply of the nails, which have been known to drop off during its long or over use.

The results of the trials known to me of the cotyledon umbilicus have not been favorable as to the arrest of epilepsy; yet, when scientific are forced to yield to empirical indications of treatment, it may be tried.

Ice to the upper spine and back of the head I have found useful in controlling the violence of the fits; as a cure, it is inapplicable. Tracheotomy is a last resort, whilst scarifications of the internal larynx during the interval may relieve the tendency to engorgement, œdema, and reflex irritability. Powerful stimulants, as ammonia and *ess. ol. sinap. dilut.*, to the spine, in proper eccentric cases, induce such changes in the centres as render them inoperative to the changes effected by the disease, or attracts to superficial expenditure.

Transactions of the Medical Society of the County of Kings.

REGULAR MEETING, AUGUST, 1860.

Case of Malformation and Malposition of the Kidneys—Death from Bright's Disease, Abscess in the Kidney, and Pericarditis. Reported by Dr. TURNER.

W. T., a German, aged 32, employed in the Kings County Hospital, applied to me to prescribe for him about the 1st of February last.

He complained of severe paroxysms, of pain in the hypogastric region, nausea, diarrhoea, and difficulty in micturition. There was tenderness on pressure in the median line between the umbilicus and the pubes, the tenderness extending into the right iliac region.

From the fact that the patient's bowels had been constipated for some time previous in connection with the fullness and tenderness present in the region of the cæcum, I looked upon the case as one of slight enteritis, probably induced by fecal accumulation, and treated it accordingly.

In a few days he was up and attending to his business, but was soon seized with another attack of colic, more severe than the first; this soon yielded to treatment by anodynes and warm applications to the abdomen. This attack confined him to his room for two or three weeks, after which he continued his occupation, but still remained debilitated; complained of irregular appetite and constant thirst, and he noticed that he passed a much larger quantity of urine, especially at night.

About the middle of July his face and legs became œdematous, and he had diarrhoea and vomiting occasionally. It was discovered at this time that his urine was highly albuminous.

He commenced to suffer from pains in the chest during the first week in August.

These slight pains finally settled into severe pain in the cardiac region, accompanied by paroxysms of dyspnoea. These symptoms were relieved by sinapisms, but continued to recur up to the time of his death, on the 13th of August.

Two days previous to his death, his urine was examined and found to be very albuminous, and the microscope showed that it contained a considerable amount of pus corpuscles.

It is worth mentioning, as an important negative symptom in this case, that the patient had no pain in the back at any time during the course of his disease.

The autopsy was made thirty hours after death. The lungs were congested in their lower lobes and posterior portions, and were œdematous throughout their whole extent; otherwise they appeared normal.

The pericardium was attached to the heart by recent adhesions of soft, easily detached lymph.

The liver was large, and on its exterior surface, beneath the serous coat, were numerous cysts, varying in size from the head of a pin to the size of a pea.

The mucous coat of the stomach was of a reddish-gray color, and

several circular spots about one-half an inch in diameter were observed in the course of the greater curvature.

The kidneys were absent from their natural position; but resting on the third and fourth lumbar vertebræ, and immediately over the bifurcation of the aorta, was one kidney formed by the congenital fusion of the two together.

This abnormal kidney measures five inches across, three inches from its upper to its lower edge, and is about one inch in thickness.

Its anterior surface shows a division into three nearly equally-sized parts, the left third being again subdivided into four lobes.

The ureters are given off from the anterior surface, and are only about one-third their usual length, (16 to 18 inches.) The left is six inches long, leaves the kidney by two branches about one inch in length, one branch coming from the upper, the other from the lower border of the organ. The ureter on the right side is five inches long, and is not branched like the left.

The posterior surface of the kidney is not lobulated like the anterior, and it has more the appearance of two kidneys joined.

The cortical structure, when stripped of its investing coat, had the rough appearance peculiar to chronic degenerative disease of the kidney. When cut into, it looked fatty; and examined under the microscope, oil globules were seen in abundance.

On the right side, posteriorly, was found an abscess in the cortical structure, containing half an ounce of thick, greenish-colored pus. No communication was perceived between this abscess and the renal pelvis.

The supra-renal capsules were found in their natural position, were of usual size, and normal appearance.

Cold—A Cause of Miscarriage. By DR. GEO. J. BENNET.

The frequent occurrence of abortion or miscarriage, with the consequences often of ill health and injured constitution that follow, and the calamity that many consider it to be, make it a subject of great interest to the practicing physician, and a word said, or a thought suggested as to its cause and prevention, may be admissible, although much has been said and written on the subject. But it seems to the writer, that among the many causes named, the principal *one*, or that one which more than any other determines miscarriage, has been mostly overlooked, or only slightly alluded to in the works that he has consulted in reference to this matter; nor do I recollect of my

preceptor, for whose teaching in midwifery I still entertain the highest regard, giving it any important place in his instructions.

The determining cause of a majority of the cases of abortion or miscarriage that I have been called to treat, seem to me to have been brought on by just taking cold. *An ordinary cold, with the derangements of health attending it*, to my mind, more frequently than all other causes together, determines this unfortunate occurrence.

In taking cold, we constantly have congestion of one or more organs of the body, in greater or less degree.

Certain organs, much oppressed by the congestive state, find relief in hæmorrhage, as sometimes, fortunately, the *brain* is relieved by *epistaxis*, the *lungs* by *hæmoptysis*, &c., &c. Now the impregnated uterus, for certain reasons, has much more hæmorrhagic tendency than any other organ of the body.

First, its central position between two of the most important emunctories of the system, any inordinate action or oppression of which may involve coincident inordinate action of this organ.

Next may be remembered the well-known (but little understood) nature of the womb, as the focal centre of all sympathetic action of the highly susceptible female organization. The passions, impulses, excitements, violent emotions, all those electrical workings of woman's impressible and emotional nature, griefs and fears as well, all find their intensity of action culminating in the womb. From all these greatly varied sources, premature action of the organ, with hæmorrhage, may be induced.

In the third place, of the most important reasons why the uterus, more than any other organ, is liable to hæmorrhage, will be remembered its condition of *congestion*. For we are always to look upon the womb, when bearing its fruit, as being in a state of congestion; but this congestion, as natural, *physiological*, consistent with the most perfect health; still *being* in this *congested state*, it is eminently liable, from sufficient cause, to receive such additional afflux of blood as to change it rapidly from *physiological* to *pathological* congestion, and hæmorrhage, with threatened miscarriage, follow.

Closely connected with this view is one of the causes of miscarriage named by authors, and recognized as such, viz., the death of the *fœtus*. Now, the death of the *fœtus* comes in for its share in the causes of premature labor; but we may, in most of these cases, inquire, What caused the death of the *fœtus*? and reply, A change of the physiological congestion of the uterus to pathological, causing separation of

the placenta, hæmorrhage, internal or external, and death of the fœtus.

Although there is a fearful array of causes hinted at, or named above, and others could be cited, the consideration of which might be regarded as important; still, the object of this is not to review *all* the causes of miscarriage, but to call attention to *that one* which the writer considers the most important, or most frequently superinducing this disaster.

It might be asked here, if all this array of causes was not enough to conflict the opinion given above, viz., that "taking cold determines miscarriage more than all other causes;" and the answer would be, the results of many years' experience lead me to say, that all these do not furnish sufficient reason to recede from this proposition.

A word must be permitted as to the circumstances under which we take cold. I think we seldom take cold of any severity, without that condition of ill health being preceded by other derangements, such as we understand by the terms constipation, bilious condition, congestion of the portal circulation, disordered state of the stomach and bowels, &c., &c. In the derangements of health indicated by these terms, the power of resisting atmospheric changes or influences is reduced, and we are rendered liable by just so much to fall under the influence of cold, or in common language, "take cold," and then may follow, in the cases under consideration, the consequences alluded to above.

This prepares the way for me to bring forward the few things I may venture to say or suggest as to treatment.

Undoubtedly, we all propose to arrest threatened miscarriage, and save the patient from the calamity, if it has not advanced too far; how far it may proceed and yet be arrested, I may not stop to inquire, although I should be pleased to, for I fear this trouble is sometimes permitted to go by "default," when it might have been successfully treated, the fœtus saved from destruction, and a mother's fond hope realized; but this question does not belong to the one under consideration.

We shall certainly secure success in cases not too far advanced, just in proportion to our fortunate adjustment of treatment to the provoking cause.

The value of theories in medicine is to be estimated by the practical advantages they yield.

In my early practice, following in the best manner I could the instructions received during student life, I gave opiates, astringents,

anti-hæmorrhagics, &c., &c., when called to cases of threatened miscarriage with even moderate hæmorrhage; and I made some patients who were only slightly ill, very sick with my treatment; and it has fallen in my way to meet some cases in the hands of older practitioners than myself, who treated similar conditions in similar manner, with the same undesirable results—of course, long ago.

I have often had occasion to be thankful for the happy results that have followed the use of such remedies where they were needed, but I constantly feel that their use must be avoided as the *first* medicines, unless the hæmorrhage is quite profuse.

In cases of threatened miscarriage with any considerable amount of hæmorrhage, we must use the *most efficient remedies to restrain the flow of blood first, whatever the cause may be*. The patient must be saved from fatal hæmorrhage, and the *cause* attended to then, and afterwards, as circumstances will best admit. But if, as most of the cases coming to us turn out, there should be but slight or moderate hæmorrhage, the best way to prevent its becoming free or alarming, is to address ourselves to the *cause*; and if *this* is found to be derangements of the digestive apparatus, and cold taken upon these conditions, as it so commonly happens, while we provide our patient with opiate and astringent treatment, and all such means and appliances as are necessary to restrain profuse hæmorrhage, to be employed if required, we shall find *mild laxative and alterative treatment*, often to be combined with the *febrifuge and opiate*, the most appropriate.

Mild laxatives, such as syr. of rhubarb and castor oil, of each ℥ss.; syr. rhubarb and cream-tartar; cream-tartar alone; sometimes blue pill and rhubarb; and even in some cases, a fair dose of calomel and jalap. With any of these may be associated an opiate, such as may be indicated by the accompanying pains.

The occasion for the use of alteratives nearly always exists, and they are to be employed on the same plan as we use them when similar derangements of health find other and widely different ways of manifesting themselves.

Ipecac with nitratis potassæ, where there is febrile excitement, often proves an invaluable agent, acting in these cases as an anti-hæmorrhagic, antispasmodic, and an equalizer of the circulation. Venesection *used to be frequently employed*, and with good success too, from the very considerations that I have presented here, viz., the physiological congestion of the uterus having suddenly merged into pathological, which venesection, with other suitable remedies, is well calcu-

lated to relieve. Although I believe of late it is seldom practiced, or necessary.

I cannot claim to have succeeded to my satisfaction, in bringing out this, to my mind, important matter; but I must indulge the hope that the few things I have offered may serve to call attention to the fact, that falling under the influence of cold, or as we commonly have it, "taking cold," is more frequently a superinducing cause of abortion or miscarriage than any other or all other causes; and that addressing our remedial agents to these conditions, as well as the collateral circumstances, will be found in the sick room and in the time of danger the plan of treatment; no matter what speculations we may indulge, or theories we may be partial to in other places, that will stand by and sustain the physician, who judiciously practices upon it, and in the best manner avert threatened calamity, and rescue the patient from her peril.

A Case of Enormous Sloughing Ulcers produced by Mustard. Reported by DR. JOHN G. JOHNSON.

On Friday, August 3d, a puny emaciated child, with a dull, sunken eye, was presented at my service at the Long Island College Hospital, with the following history. The child at birth was strong and healthy. The parents were both healthy. The mother had rapidly recovered from her confinement without any drawbacks, having a full supply of milk.

The child grew rapidly and vigorously until it was six weeks old, when one evening the mother gave it three drops of laudanum for the colic. The laudanum had been procured a few days previously at a respectable druggist's it was perfectly clear, and it is presumable was of the strength of the U. S. Ph. The three drops produced profound narcotism.

A neighboring physician was called in, and among other things, directed sinapisms to the abdomen, and to the calves of the legs. No specific directions appear to have been given in regard to the manner of preparing, the mode of applying, or the length of time the mustard should be left on; as the pure mustard was mixed with water, and applied directly to the skin, with nothing interposed. The mustard remained on, as nearly as could be ascertained, about one hour. The mustard plasters were merely removed, without washing the limbs afterwards. At the time the mustard was removed the skin was reddened only. The next day the midwife directed linseed meal poultices to the limbs, as they had commenced to mortify.

The child had no medical treatment for the next four weeks, until it was brought to the Long Island College Hospital in such a condition of extreme exhaustion, that no one thought it could live for more than a day or two. There had been a complete slough of both calves. The right one, extending from an inch above the condyle of the femur to the tendo achilles, occupying the posterior two-thirds of the limb. The left one from the popliteal line to the tendo achilles and the posterior half of the leg. The whole of the integument, areolar tissue and muscle had been completely destroyed, leaving the tibia and fibula merely covered by the periosteum. The edges of these ulcers were elevated and everted. There were no granulations, the whole base being of a dirty gray color. On the mons veneris there was a deeply excavated ulcer, which had destroyed nearly the whole mons. On the nates there was another of the same character. These had apparently been produced by mustard, having dropped on those parts and being left.

The case was seen by Prof Hamilton, and Drs. Davol, Hallet and Clark, all of whom regarded it as a hopeless case. More for the sake of doing something than with the expectation of a cure, I directed half a tea-spoonful of cod-liver oil three times a day; the ulcers to be kept moistened with an infusion of poppies, and the child to be kept on the ferry-boats two or three hours a day; that the mother should take ale with her meals at least once every day, and if the child should seem to grow weaker, to give it a few drops of brandy and water occasionally. The next day the child appeared to have rallied; the treatment was continued, except the poppy fomentation was changed for the application of ung. zinei. oxid; 1 part to 7 of axungia.

Aug. 15th.—The child is much stronger than a week ago; the edges of the ulcers are flattening, and red granulations are springing up; the ulcer of the mons veneris looks quite healthy. Treatment is continued; in addition, the child is to be bathed with warm New England Rum and water every day.

Aug. 17th.—The ulcer on the mons has nearly healed; that on the nates looks much better; there are healthy granulations all over those on the legs, and they are commencing to cicatrize at the edges.

Aug. 27.—The ulcer on the mons is completely cicatrized; there is left a deep excavation; the ulcers on the legs are nearly cicatrized; the feet, which had been drawn up by the action of the flexors, are now contracted by the cicatrices.

Sept. 6th.—The ulcers are completely healed, with firm cicatrices; discharged; cured. The cicatrices are depressed much below the level

of the surrounding integument. The recovery of the child was a result which no one anticipated who saw her at the time she was first brought to the hospital. When I was a student with Dr. James R. Wood, a little child was brought to his office with a large slough of the right side, produced by a blister applied to the chest by a dispensary physician for pneumonia; several of the ribs were exposed.

Cases like these almost justify the conclusion of Dr. West—to abandon almost entirely the use of blisters and sinapisms in the treatment of young subjects.

Beck, in his *infant Therapeutics*, relates the case of death from the application of mustard. Pereira mentions that he has seen two instances of death from the gangrene caused by the applying of blisters after measles. Prof. Dunglison has also seen several cases of death produced by the use of blisters in scarlatina and measles. A moment's consideration will show that the general rule of applying a blister for so many hours cannot be a safe rule. There is such a difference in the susceptibility of the skin in different subjects, and even in the same patient, in different parts of the body. Thus, West says, "The skin on the front of the chest is peculiarly delicate, and a blister applied there for two hours would almost certainly vesicate, while it might not produce the same effect in double the time if applied beneath the scapula."

In cases of great constitutional prostration or emaciation, the risk is great, as is shown in the above cases; there being so little vitality, a slough may follow what would be considered a short application; and one objection advanced by Dr. West is by no means a slight one. He says: "The constitutional disturbance which they produce, the pain while they are drawing, the soreness of the surface while they are being dressed, and the itching and irritation which accompany their healing, often keep up an amount of restlessness and feverish irritation that are in every way prejudicial to the child's recovery."

If, however, it is determined to apply a blister, it should be applied for a short time, and then the edge should be raised to see if it has commenced to redden; as soon as the skin is reddened, the blister should be removed, the skin carefully bathed, and a poultice applied; the blister will almost invariably raise with the application of the poultice with far more safety to the little patient, than if the blister had been kept on for any prescribed number of hours. A single word as to the use of laudanum. Beck mentions the death of an infant from a single drop of blood. In the *London Medical Gazette* for Nov. 6, 1846, there is an account of the trial of a nurse, for causing the death of a child 5 days old, by the administration of two drops of laudanum. In

this case, 3 drops nearly cost a child of six weeks its life. It is such a potent agent that it should not be used in the treatment of infants without judicious medical advice.

Dr. MITCHELL reported a case of injury to a child *æt.* 5, by the falling of a bundle of hides from the third story of a storehouse, on the child's head. When first called, he found the child with a sunken countenance, pale, cold skin, almost pulseless, and bleeding from left ear. After administering a little brandy and water, there was moderate reaction, and he then complained of violent pain in the left groin, then in the thigh, and of having a tired feeling in the leg, all of the left side. These pains came in paroxysms, and were very violent; there was no tenderness on pressure. Next day the pains and tired feelings continued, but at longer intervals.

Enjoined perfect quietude, and administered a little castor oil. After four or five days permitted him to set up awhile. The pains have gradually subsided, and now, nine days from the time of injury, he appears pretty well; seems disinclined to try to walk, but crawls about on his hands and knees. Has no pain, but says his leg is "asleep." In answer to an inquiry from Dr. Mitchell as to the value of bleeding from the ear as a symptom, Dr. Enos remarked, that bleeding from the ear should, he thought, always be regarded as a grave symptom in injuries of the head; but if the bleeding was unaccompanied by serum, he did not regard the symptom as absolute evidence of a fracture at the base of the skull. When the bleeding was accompanied by the discharge of serum, he looked upon it as positive evidence of fracture at the base of the skull, and he knew of no such case that did not terminate fatally.

Dr. BELL referred to a case which occurred in his practice about a year ago, of a man who received an injury of the skull, followed by bleeding from the ear, succeeded the day after by a serous discharge. This case was followed by no active reaction; the man complained of dizziness on attempting the upright position, and was therefore easily kept to the semi-recumbent position which was enjoined. His bowels were moved by a small dose of calomel, and at the end of the tenth day he was well enough to walk about the house, up and down stairs. Cautioning him against sudden movements, or any more active exercise than walking about the house, for at least one week longer, visits were discontinued with that understanding. On calling at the expected time, was informed at the door that the man was dying. He had wilfully gone out the next day after my last visit, was caught out in a drenching rain, got home very tired, and was taken with chill, fol-

lowed by what the physician who was called in pronounced, *congestive bilious remittent fever*, of which he died on the sixth day, sixteen days after the injury. The physician subsequently became satisfied that he died of compression of the brain, caused by fracture at the base of the skull; the man was comatose from the beginning of the fever; had no convulsions. The doctor was deceived by not having a history of the case.

Dr. ENOS reported a case of fracture of the skull, os frontis, with depression, for which, though there were no symptoms of compression, the patient was trephined. The inner table was found to have sustained, what is by no means unusual in such cases, a more extensive fracture of the inner than of the outer table of the skull. The bone was raised, and the patient at first appeared to do well. Yet after a few days, he seemed to have slight fever, which produced a good deal of prostration, though without urgent symptoms; and at the end of about a week he died, being unconscious only about twelve hours before his death.

On post-mortem, the whole circumference of the brain was covered with pus, showing that an unusually active inflammation of the membranes, resulting in suppuration, had taken place without other symptoms than such as usually characterize a febrile state. This case, he thought, was in one respect similar to Dr. Bell's, likely to have been mistaken by any one unacquainted with the history of it.

Of epidemiological diseases, Dr. MARVIN reported two cases of children, one nine months old, and the other between three and four years, with decided cholera symptoms. The younger one died within twelve hours; the elder recovered. There was in these cases well-marked collapse, with rice-water discharges. They both occurred early in the summer.

He had had quite a number of cases of infantile diarrhœa, and some dysentery, but altogether less than usual for the season of the year, and the cases kindly yielded to treatment.

Dr. MITCHELL'S experience accorded with Dr. Marvin, in the unusual healthiness of the season. He had had no such cases as the two reported by Dr. Marvin with cholera symptoms; on the contrary, he had noticed that the diarrhœa cases in his practice were rather of mucous character.

Dr. MULHALLON had had more or less scarlatina all summer, but the cases were mild. He had not seen so much of this disease in the summer heretofore.

Dr. BELL reported a family of a mother and three children affected with diphtheria of unusual malignity. The first case, the eldest child,

aged 4 years, was taken on the 4th of August. The doctor was called to see it next day; found the child's jaws stiff from the acute and extensive inflammation of the parotid and submaxillary glands; fauces, nares, and cheeks completely lined by diphtheritic membrane, causing great dyspnoea; skin burning hot; pulse 160; tongue protruded with difficulty; also thickly coated with exuded membrane. Ordered frequent ablutions with lukewarm water, and exposure to the air; and for diet, thin sago gruel with wine, and to give wine a little at a time, frequently diluted with a saturated solution of chlorate of potash. On the fourth day the nose began discharging, and for the next three days discharged profusely; the membranes of mouth and fauces also softened about the same time, and was thrown off in large quantities for several days. The child was then able to take meat soup, and enjoy the wine a little sweetened. Citrate of iron and quinine was given, $2\frac{1}{2}$ grains thrice daily.

On the fourteenth day, considering him well enough, directed that he be taken out and aired in the ferry-boat. While out, he was taken with convulsions; was called soon after, and by the use of ordinary means the convulsions ceased. On the third day afterwards convalescence seemed to be again established. The tonic treatment was continued.

On the 24th, 20 days from beginning of the disease, he was brought to my office *with dropsy*, face puffy; limbs anasarctous; abdomen prominent. Added to his treatment, ol. juniperi gtt. iij, thrice daily, and loins to be rubbed with dilut. ol. tiglin. Was unable to collect any of his urine for examination, but from appearance on bedding it was evidently scant. In the course of ten days he passed his urine freely; swelling rapidly disappeared, and he seems now on the right road to health.

The second case, æt. 3, was taken on the 10th, and the 3d, æt. 15 mos., on the 13th. Each of these died on the fourth day of the disease, before the membrane sphacelated. In one of them, on the second day, there was a petechial eruption about the neck and abdomen. The mother also had the disease, but in her case it was more adynamic. She recovered under good diet and stimulating tonics. This family lived on the garret floor of a tenement house, 331 Columbia Street. The yard and cellar of the house contains a large mass of decomposing material. The whole neighborhood is in a filthy state.

Case of Hydrothorax. By DR. ENOS.

Robert S., a boy eight years old, not usually very robust, having

rather a flaccid constitution, I was called to see on the 17th of September last. He had just returned from the country, where he had spent the summer; had not complained of pain, but for the last few days had not played with his usual eagerness, and he would stop for breath in going up stairs; still he was out every day, but he tired easily. No pain and no cough to attract attention; his pulse now, when quiescent, was 120, and the respiration 28.

On examining the uncovered chest, an unusual fullness was observed on the left side, and it measured one inch more than the right. The intercostal spaces were obliterated, and the apex of the heart was seen and felt beating in the median line. There was complete dullness or flatness on percussion throughout the entire extent of the left pleural cavity, from the apex above the clavicle, down to the diaphragm. Bronchial respiration heard in the region of the middle lobe; and in that of the inferior, faint but distinct respiratory murmur was heard, growing weaker as the ear was passed along from the spine, forwards over the affected side towards the median line in front. This was doubtless transmitted from the sound lung, whose normal sounds have been intensified by increased labor. The bowels were regular; the stools of a yellow color; urine a little less than normal in quantity, but not albuminous; appetite fair; ordered iod. pot., and mint. water and also cream.

Oct. 1st.—Rests better at night; pulse 100, and respiration 24; has been taking regularly gr. v. of iod. pot. in a drachm of mint water thrice daily, and also half pint of cream in the course of the day with his food. When the weather was mild he was allowed to walk out. A small blister had been applied to the chest, which worked kindly at first, but as there was a tendency to ulceration and suppuration, it was not repeated. At this date the lung was clear and resonant to the lower angle of the scapula; apex of the heart $1\frac{1}{2}$ inch to the left of the median line; urine more free.

Oct. 15th.—Serum nearly all gone; lung fills the chest well; heart nearly in its normal position; the medicine has been continued, with an interruption now and then of a day or two; the half pint of cream and good food have been taken daily; he sleeps quietly, and has a normal pulse and respiration. Prof. Hamilton saw this case with me, and concurred in diagnosis and treatment.

MONTHLY SUMMARY OF FOREIGN MEDICAL LITERATURE.

By DR. L. ELSBERG.

32. *How to Prevent the Disagreeable Vomiting, after Inhalation of Chloroform.* By Dr. R. FISCHER. (Wiener Allgem. Med. Zeitung, 26, 1860.)
33. *The Alterations of the Tongue in Diseases.* By Dr. CARL NEIDHARDT. (Archiv für Wissenschaftliche Heilkunde, V., p. 294-318; Schmidt's Jahrbücher, March, 1861, p. 338.)
34. *On the Treatment of Neuralgia.* By Dr. SIEVING. (London Lancet, Feb. 2, 1861.)
35. *On the Physiological and Therapeutical Properties of the Peroxide of Hydrogen.* By Drs. RICHARDSON, THUDICUM, LANKESTER, etc. (Transactions of the Medical Society of London, 1861.)

32. According to Dr. Fischer, a glass of wine taken 15-30 minutes before chloroform, will entirely prevent the vomiting so often troublesome after inhalation. Perhaps, he adds, the dangers may also be lessened by this simple means. [We feel bound to confirm Dr. F.'s positive statement to some extent, having frequently with great benefit administered wine before producing anæsthesia. The desired effect seemed in all cases to be produced more quickly and safely, (*i. e.*, with a smaller quantity of the anæsthetic,) and though we had not directed special attention to the vomiting afterwards, we do not remember that it ensued in a single one of these cases. Our experience in this respect is further borne out by that of a friend, a dentist, of this city. L. E.]

33. Omitting other abnormal conditions of the tongue, Dr. Neidhardt arranges his remarks under three heads of coating, smoothness, and dryness.

a. *Abnormal coatings* depend essentially upon a prolongation, loosening, and discoloration of the epithelial processes (*cilia, appendicæ epithelice*) of the papillæ. Whether a catarrhal condition is its cause, seems questionable; at least the places on the tongue free from coating show no hyperæmia. Certain it is that disordered nutrition occurs extraordinarily easy in the epithelium of the tongue. As to the *extent* of the coating, it is either total or partial; in the latter case it is either symmetrical, *i. e.*, covers corresponding portions of the tongue, or is unequal, sometimes entirely on one side. This, as well as the coating of the tongue in health, is owing to the motions of the tongue, and the friction it sustains. Thus the coating is found on only one-half of the tongue in cases of paralysis of one side of the tongue, as also in cases of one-sided neuralgia trigemini. The symmetry of the coating often depends entirely on the form of the tongue, as *f. i.* in the conical; while unsym-

metrical, partial coating, may be owing to accidental circumstances, as want of a tooth, projecting teeth, &c.

As variable as the extent, is also the amount or *thickness* of the coating. It also depends mechanically on the use and friction of the tongue, and is not proportionate to its roughness.

The *color* is at first grayish-white. It is changed from substances introduced from without, or from such as come from the body itself. Among the first, articles of food and medicines, as well as atmospherical dust, must be taken into consideration, besides special coloring matters. The discolorations from the body may arise from blood or biliary coloring matter. Blood extravasates on the mucous membrane of the tongue almost only in very severe diseases, when, in consequence of extreme dryness, fissures and rupture of superficial capillaries occur. The color may vary from reddish to black, constituting the rusty coating. The yellow coloration does not seem to be produced by biliary coloring matter, as is generally supposed, for it is found absent in the most intense icterus; it is owing, more likely, to the ingesta. The brownish color is connected with dryness of the tongue. The so-called *raspberry* tongue depends on the contrast in appearance of the filiform and fungiform papillæ. The latter having but little and translucent epithelium, are plainly to be seen as red points, when the former by the alteration of their epithelium produce the coating; the fungiform papillæ being especially numerous on the anterior half of the tongue, it is here, too, where the raspberry appearance is most observed. This appearance is by no means characteristic of scarlatina, as many believe; it is quite common in children, with slight and even with normal coating, and has, therefore, neither in children nor in adults the slightest diagnostic value.

The *composition* of the abnormal coating resembles that of the normal coating of the tongue; *i. e.*, it consists of masses of epithelium, epithelial processes with granular cells that are thrown off, fat particles, fungi, and accidental admixtures.

The *cleaning* of the tongue usually proceeds gradually, the coating getting thinner and thinner; it is but seldom that the coating is thrown off in its whole thickness at once. Cleaning over the whole extent of the tongue never occurs at one time. The first clear portion is mostly the point of the tongue, where the cleaning proceeds to the edges and regularly backwards; sometimes the middle, very seldom the posterior portion, are first cleaned. The cause of this variation is, most likely, the varying forms of the frictional motion of the tongue; solution or absorption of the epithelial cells is unsatisfactory explanation, and has

never been proved; and a clearing up of the darkened or discolored cells is certainly very improbable.

The adherence of the coating to the tongue depends generally on its duration; reproduction after artificial removal is undesirable, as showing the continuance of the diseased condition.

The *taste* is either unchanged, especially with slight coating, or cannot be indicated by the words so often quoted.

The *diagnostic signification* of the coating is limited entirely to the fact of indicating the existence of some diseased condition in general. [?] In a *prognostic* point of view, the disappearance of the coating is of value, as it is one of the first signs of the decrease of the disease. The significance of the dark coatings of a dry tongue will be considered under the latter heading.

b. *The Smooth or Shining Tongue*.—In consequence of the direction of the papillæ, the tongue, normally, is smooth on rubbing backwards, but rough to the touch, passing over it from the back, forwards. In disease, an extraordinary smoothness is not of unfrequent occurrence, accompanied, too, by reddening of the mucous membrane, and diminution of papillæ. The papillæ become smaller—and the smaller they become, the greater is the reddening; for the epithelial covering becoming thinner at the same time, the blood is more easily seen through it. The abnormal smoothness of the tongue depends on the separation of the epithelial processes. The fungiform papillæ appear more prominent, on account of their thinner epithelial covering. Partial separation causes only partial smoothness. The smooth, shining tongue, being moist, reflects. Abnormal smoothness is found in acute as well as chronic diseases. In the former, it is without diagnostic significance, and, following generally the separation of the coating, has only the prognostic value of the cleaning of the tongue, as the epithelium is quickly reproduced in convalescence. In chronic diseases the smoothness indicates deficient reproduction of epithelium, from greatly disordered nutrition, without, however, indicating the nature of this disorder; it is unfavorable, prognostically, the disease being mostly incurable.

c. *The Dry Tongue*.—Dryness of the tongue is found in various degrees in health as well as in disease. It may be so excessive as to interfere with motion and with taste. The tongue is generally dry, partially, or over the whole extent, only on the back. If the smooth tongue becomes dry, it ceases to reflect. The color depends on the coating, which, as already mentioned, in extreme cases of dryness, becomes dark from fissures and rupture of the blood-vessels. For prog-

nostic purposes, it must be noticed whether the dryness is only temporary or continues, and for how long it can be made to disappear by moistening. Temporary dryness is caused by breathing through the mouth, and is of no consequence. [Though the habit of some persons of breathing continually through the mouth is an unnatural and injurious one—the cause of snoring while sleeping, etc.—L. E.] When dryness lasts for days, and when it cannot be relieved by moistening the mouth, it is serious. Dryness usually commences at the middle, because that portion is least touched by the moisture of the mouth. Diminution of this moisture is the nearest cause of the dryness; the secretions of the mouth may be actually diminished, evaporation increased, or both these circumstances co-exist. Dryness is, therefore, almost always met with in unconscious patients, who do not feel its inconvenience. Its diagnostic importance is limited, excluding accidental drying circumstances, to the proof of some disease. Appearing in the course of acute diseases, and not yielding but for the moment, to moistening, the prognosis is rendered unfavorable; the greater the degree, the more unfavorable, of course. The becoming moist again of the tongue, especially when it continues, is a favorable symptom.

Folds and Cracks of the Tongue.—Folds on the tongue are of no importance whatever. They occur only after about the eighth year, generally, increase in number and depth with age, and are connected with the frequent change in the form and position of the tongue. If the tongue is coated, the papillæ in the folds remain coated longest, on account of their being less exposed to friction. Discolorations, for the same reason, are seen here longest. From the folds, cracks may follow a contraction of the mucous membrane in extreme dryness. As these cracks heal, cicatrices form, which are distinguished from the folds by the absence of papillæ.

34. The treatment of neuralgia must be considered under two main points of view. We have to deal with the pain in the paroxysm, and we must seek to meet that morbid condition, whether of the solids or the fluids of the body, upon which the pain depends, so as to prevent its recurrence. The former indication is met by various remedies, amongst which, opium and its preparations, applied locally or given by the mouth, occupy the first rank. But, however grateful the sufferer may be for the relief they afford, they rarely, if ever, suffice to effect a cure without the aid of other agents of an alterative or roborant kind. The topical application of opium or morphia operates variously, according to the manner in which the application is made. It may be laid on the unbroken surface in conjunction with hot fomentations or poultices; it may be used endermically, the anodyne powder

being sprinkled over the cutis, from which the epidermis has been removed; or a solution of morphia may be injected into the cellular tissue by the aid of a small syringe. Dr. Kurzak, of Vienna, was, I believe, the first to employ the subcutaneous or hypodermic method, which was then largely used by Dr. Wood, of Edinburgh, and has now been tested all over the country by numerous practitioners. Whichever method we avail ourselves of, it is scarcely necessary to say that the application should be made at the seat of the pain, or as near to it as possible. This holds good equally of veratria, aconite, chloroform, or belladonna—of hot fomentations, turpentine stupes, or of such counter-irritants as croton oil, vesicatories, or issues. The external application of tincture of opium with moist heat is often of great use in the milder forms of neuralgia, and has stood me in good stead in various cases. It is important that the medical man should himself apply the fomentations in the first instance, as they are often used negligently, and applied tepid instead of hot. The physician's aid-de-camp should be as trustworthy a person as the aid-de-camp of a general, or his orders will be as recklessly carried out as the order that led to the gallant charge at Balaklava. The medical man should take as little for granted in the sick-room as possible, and think nothing that concerns the welfare of his patient beneath his notice. The endermic application of morphia cannot be used where the disease is very paroxysmal, or the attacks of pain very brief; but in protracted cases of neuralgia—as, for instance, in gastrodynia—I have often found it of great value. I order a space of the size of a five-shilling piece to be blistered, the raised epidermis to be removed, and a powder, containing a grain of morphia to four grains of white sugar, to be sprinkled over the surface. A simple dressing is then applied. Three or four powders may be applied in this way on successive mornings, or at still shorter intervals. There is generally a little smarting pain at the time of the application, but soon after relief generally ensues from the narcotic.

In the anomalous pains of the back accompanying uterine and ovarian derangement, the endermic application of morphia to the lumbar or sacral regions is often of decided service.

35. Peroxide of hydrogen, which was discovered by Thénard in 1818, is, in fact, water charged with oxygen in the active state. In his paper, Dr. Richardson took up the following points:—The history of the substance; its preparation, with special regard to pharmaceutical applications; its physical and chemical properties; its relations to ozone; its physiological properties; its therapeutical value.

It was obvious, from the author's description, that some obstacles lie

in the way of the application of the peroxide of hydrogen for medicinal purposes, owing to the difficulty experienced in its manufacture. This difficulty, however, Dr. Richardson greatly simplified; and we should infer that any experienced pharmacist could supply the medicine after a short acquaintance with the process of making it, as readily as quinine or other remedial bodies, in preparing which time and care are the most important requisites. It was shown, indeed, that if perfectly pure peroxide of barium were supplied to the profession, every practitioner in the country could make his own solution of oxygen as he might want it.

The description of the chemical and physical properties of peroxide of hydrogen was unusually interesting. Passing over the facts relating to the influence of inorganic bodies upon it, those bearing on organic matter strike one most forcibly. Thus, blood freed from fibrine absorbs the oxygen from the peroxide, and, if it is venous blood it becomes arterial, with a rise in the temperature. Washed fibrine and cellular tissue in the fresh state evolve the oxygen. Albumen, urea, gelatine, fibrous membrane, and skin produce no change. Grape sugar, and, indeed, all the sugars brought into contact with it, become decomposed, and evolve carbonic acid. Starch undergoes the same modification.

These observations refer to animal substances recently used; but when putrefaction has commenced, then the oxygen of the peroxide seems to act on all alike, and to produce rapid disintegration.

Another curious fact relating to the peroxide was, that its oxidizing power was easily prevented by the presence of certain bodies having a wide extension of names, but analogous characters. Ammonia in vapor or solution, tobacco, hydrocyanic acid, solution of aconite, and, in short, all the narcotics that are miscible with water, possess this neutralizing property; the permanency of the result being decided by the physical character of the agent employed.

The section of the paper on the relations of the peroxide of hydrogen to ozone was an interesting one, and indicated a careful study of this debated question. It is clear that Dr. Richardson looks upon the two bodies as one and the same. If he has any doubt, it is to the effect that in peroxide of hydrogen there is not any affinity at all between the two elements, hydrogen and oxygen. We pass the matter, to dwell on the physiological actions of the peroxide. These seemed to arrange themselves into the following brief propositions:—A weak solution oxidizes blood; but this effect can be stopped by the actions of the alkaloids and of narcotics. The peroxide supports the life of

fishes; but the body of the animal causes rapid evolution of the gas. The solution injected into the left side of the heart of an animal restores the irritability, but appears to have an opposite effect on the right side. Injected into the arterial system immediately after death, it seems to restore to the muscles the power of contracting on the application of an irritant. It suspends to a considerable extent post-mortem rigidity, and it reduces spasmodic action, excited by such bodies as ammonia and hydrocyanic acid. On the therapeutical value of this powerful agent, Dr. Richardson did not dwell long; but reserved this essential point for another communication. He showed, however, that as an antidote to the alkaloidal poisons, as an external application to decomposing sores, as an internal remedy in fever, where the patient literally dies from deficient oxygen, and in diabetes, the medicine might be used with the very best promises of success. In the way of a pleasant acid drink, one could give, said Dr. Richardson, to the typhus-stricken man 100 cubic inches of active oxygen per hour. In diabetes, one fact had been made out also by the author, that under the influence of the peroxide the quantity of sugar at once became less, and the excretion of urine decreased in a relative degree. After illustrating his paper by experiment, Dr. Richardson concluded by stating that, in placing it on the annals of the Society, he would guard himself, once and for all, from any exaggerated suggestions as to the value of this new remedial agent. The subject, indeed, was so novel, that after twelve months' study of it he had feared to use a sentence that had not been considered over and over again. He did not pretend to know all the properties of the peroxide. He did not bind himself inviolably to any opinion offered on the present occasion; nay, experience might show that the substance discussed in a medicinal sense took new and even different directions from those with which he had opened the argument. His own intentions and objects would be served if he did but call forth investigation and fact, let the course of things bend in whatever way they might.

Dr. Thudichum expressed an opinion that the peroxide of hydrogen, as made by Thénard's process, could not be altogether freed from chlorine; and suggested that the substance should be made by the simple sulphuric acid process. He also dwelt on the fermentation theory in relation to certain of the effects of the peroxide. He expressed a disbelief as to the existence of "ozone."

Dr. Lankester asked Dr. Richardson whether oxygen, as it was liberated from the solution, was in the active state; and Dr. Richardson having answered in the negative, Dr. Lankester proceeded to defend

the ozone theory. He believed with the author of the proposition to use the peroxide of hydrogen as a medicine, that great therapeutical effects would come from it. He suggested experiments to determine whether the amount of excreted matters—such as urea and carbonic acid—would be influenced by the administration. It was a remarkable fact, that so powerful a substance should so long have remained uninvestigated as a medicinal agent.

Dr. Garrod compared the chemical effects of the peroxide of hydrogen with the effects of the permanganates. He had tried the permanganates in diabetes; but he thought with the effect only of increasing the amount of sugar. He would wish to hear whether the physiological effects of the peroxide and of a permanganate were the same. It might be that the saline character of the latter produced a difference.

Dr. Richardson, in reply, said that in regard to the presence of a trace of chlorine in the solution, it made no difference; for the effects of chlorine-water were very analogous, and it might turn out ultimately that a direct relationship could be traced between chlorine and oxygen water. Thus, water boiled free of oxygen, and charged very feebly with chlorine, would, as he should show on another occasion, support the life of a fish longer than the water altogether destitute of oxygen. In respect to ozone, he had no doubt that such a substance existed, and he was inclined to think that it was a modification of oxygen. He thought that, in testing the effects of the peroxide of hydrogen, it were best to try it in disease without any further intermediation, selecting for its trial extreme diseases, such as were not at this time amenable to treatment. The actions, *physiologically*, of the peroxide of hydrogen and of the permanganates were entirely different: the latter injected into the veins of a horse produced permanent fluidity of blood, and transformed the blood on the arterial side to the venous color. The difference depended on the fact that in the permanganate the oxygen was combined, while in the peroxide it might be considered as virtually free.

Dr. Garrod, Dr. Radcliffe, and several other Fellows, observed that they should be anxious to give the peroxide a fair trial as to its therapeutical value; and inquiry was made as to the means of obtaining the solution.

TRANSLATED FROM THE FRENCH, EXPRESSLY FOR THE MONTHLY.

Lectures on Diphtheria. (Egyptian Disease.) Delivered at L'Hôtel Dieu, Paris. By M. TROUSSEAU.

(Translated by the Editor from La Clinique Médicale de L'Hôtel Dieu, of M. Trousseau.)

(Continued from page 312.)

You have had very frequent occasion to observe these symptoms in the advanced stages of the disease in patients brought into this hospital, and once you have seen the laryngeal affection at its very commencement. It was in a little boy eighteen months old, who was strong and vigorous; he entered the hospital with his mother on account of a severe and confluent sudoral eruption with which they were both affected; otherwise than this, they were perfectly well. Six days after their arrival in the wards, where there was a child with the croup and a woman with false membranous angina, the mother complained of a sore throat. Upon examining the throat, we found the right tonsil and the uvula covered with false membranes, the cervical ganglions increased in size. I immediately cauterized the diseased parts with hydrochloric acid, and the next day the membranous concretions had almost disappeared; but twenty-four hours after, they were reproduced more abundantly, and thicker upon the uvula, and this time upon both tonsils. The cauterization with hydrochloric acid was repeated, and again the next day, although there was a marked amelioration which continued. The patient recovered.

The child was taken sick three days after the mother. We perceived a whitish, thick concretion upon the right commissure of the lips, which was the seat of a slight excoriation. I cauterized it with the nitrate of silver, and taking into consideration the age of the patient, I warned you of the danger which threatened it. In fact, the diphtheria occupied both commissures the second day; still the tonsils, the pillars, and the veil of the palate presented nothing abnormal, not even redness. The next day the false membranes of the lips were less thick, but the child's voice seemed to me hoarse. My chef de clinique, Dr. Moynier, at his evening visit, noticed the hoarseness of the cough, which had become harsh; the voice was muffled, and paroxysms of suffocation had already occurred during the course of the day. Neither the tonsils nor the palate were yet affected. An emetic was prescribed.

When we saw the patient, fourteen or fifteen hours afterwards, we learned that the paroxysms of suffocation had become so violent and so frequent, that tracheotomy had been judged necessary. The house-physician had performed it, and the moment the trachea was opened, a false membrane was thrown out. We found the child in a fever, his neck very much swollen, and the next day he died. We ascertained, by examination that very morning, the existence of a pneumonia upon the right side, characterized by dullness, difficulty of breathing, and bronchial respiration.

At the autopsy, we found no concretions, neither upon the tonsils nor upon the veil of the palate; but the larynx and the trachea were invaded by false membranes, which extended even into the smallest bronchial ramifications. Lesions of pneumonia existed throughout the inferior lobe of the right lung, and in some disseminated points in both lungs.

Croup was then first announced by a small, dry cough, occurring in short paroxysms, at short intervals. The voice, which up to this moment was clear, began to change a little, and presented, like the cough, characteristics which are important to understand, which cannot be described, but which once heard will never be forgotten. The cough is not sonorous, noisy, but rather hoarse, subdued and dry, producing a sound which may be compared to the barking of a young dog at a distance. The word *croupal* gives a wrong idea of it, for this better explains the cough of stridulous laryngitis, of false croup, than that of true croup. At the beginning, it is very frequent, but I am emphatic upon this point: it ordinarily loses this character according as the disease progresses.

Up to this moment, there is no difficulty in breathing, but after a very little while, in children, a longer time in the adult, this difficulty of breathing commences, principally at night, and then begins, at each inspiration, a laryngo-tracheal hissing sound, which is also heard, but in a less degree, in expiration. After each fit of coughing, the hissing sound becomes more marked. It is produced by a short inspiration, dry and metallic-like, which can be perfectly heard at a distance. Upon auscultating the trachea or the posterior part of the thorax, it was so loud that it masked the sound of vesicular expansion. This laryngo-tracheal sound is explained by the disposition of the apparatus of the voice. If it is stronger in inspiration, it is because the lips of the glottis, having a tendency to approach each other, render the entrance of air more difficult; while in expiration, they tend, upon the contrary, to separate. The pain felt in the larynx is generally very slight; the paroxysms of coughing induce it, however, when it is seated not only in the larynx, but in the trachea, and extends even to the anterior part of the sternum.

The disease continuing to be aggravated, the cough becomes less and less frequent, the paroxysms becoming less frequent, according as the false membranes extend, and become thicker, recurring every fifteen minutes, every half hour, and sometimes at longer intervals. The cough also loses its harshness, and is most frequently lost, while the voice, which was raucous and metallic, is also lost. The patient is often aphonic. *Vox nihil significat*, said Aretæus. These phenomena, which ordinarily accompany the difficulty of the respiration in pseudo-membranous laryngitis, are the most certain signs of the presence of diphtheritic concretions upon the lips of the glottis.

You readily understand why this is so; you know that slight mucosities, even arrested upon the vocal cords, are sufficient to alter the timbre of the voice; sometimes, even to entirely obliterate it for the time. It is not, then, surprising that there should be more or less complete aphonia, when false membranes of a greater or less thickness are form-

ed upon the lips of the glottis. The same thing takes place which happens if, between the reeds of a clarinet or a bassoon, you interpose a piece of moistened parchment; the comparison is exact, for the false membrane can be compared absolutely to a piece of parchment swollen by moisture. The larynx no longer performs its function, and the voice and the cough changing more and more as the concretions increase upon the vocal cords, end by being altogether lost. This is a physical phenomenon, which is explained readily by the disposition of the parts. If, in rare cases, the cough at times takes on a harsh tone and the voice regains its metallic character, it is because the vocal cords have been freed by violent efforts of expiration and expectoration, or that the tenuity of the pseudo-membranous concretions which line them do not hinder the air from vibrating in passing the larynx. As a general rule, the cough, croupal at first, becomes less and less sonorous.

I have said that after a certain length of time, short in children, longer in the adult, a difficulty in the respiration arises; this difficulty rapidly increases. A phenomenon then takes place, which I wish specially to call your attention to, because, under many circumstances, it might lead into error, cause the nature of the disease to be misunderstood, or at least, give rise to a belief in the success of the medication employed. Although the lesion of the larynx persists, although the mechanical obstacle to the passage of air is permanent, although the false membrane which constitutes this obstacle remains adherent to the vocal cords, *the difficulty of the respiration is intermittent*. A child or an adult, either can have during the course of the day many accesses of dyspnoea, almost reaching suffocation. During the interval of these paroxysms, if they are not agitated, if they are not frightened by the presence of the physician; if, in fine, nothing happens to disturb their tranquillity, and consequently, hasten their respiration, it will continue almost as regular as in the normal condition, and the laryngo-tracheal hissing sound will hardly be heard. But from time to time, every hour, or at first, every second or third hour, and afterwards at shorter intervals, they will be seized with fits of suffocation without any apparent cause. You will then observe that they will sit up, and sometimes they will rise suddenly, and get out of bed as if in search of air. They make great efforts, the head is thrown back, the mouth is opened widely, and all the muscles which conspire in the act of respiration are convulsively contracted. After the access has lasted four, five, or six minutes, calm is re-established, to last for a little while.

These facts, indicated by Royer-Collard in his article in the *Dictionnaire des Sciences Médicales*, and by M. Bretonneau in his *Traité de la Diphthérie*, had not escaped the earlier writers. I cannot refrain from quoting the following passage from Borsieri, who has dedicated a special passage to this subject in his chapter on croup. It is entitled *Fallax morbi mitigatio*. Animadvertendum quoque est non rarò et subito præter rationem et sine ulla materia obstruentis excretionem omnia sic in melius verti, ut liberior, imò naturalis omninò respiratio reddatur, ut infantes puerive e lecto sur-

gere et ombambulare possint: paulò post verò fallaci hinc symptomatum quieti novum repente succedere insultum sæpe numero gravem . .

* * * This intermittence of the symptoms of suffocation has been accounted for by a spasmodic constriction of the glottis, a spasm produced either by the inflammation of the mucous membrane of the air-passages, or by the presence of plastic lymph effused within it, or by both combined. This was the opinion of Vieussieux, of Albert of Bremen, of Jurine, and agreed to by the members of the commission of the Academy appointed to decide upon the Memoirs of the Concour of 1812. This commission, adopting the idea of Albert of Bremen, said still further, that if the false membranous concretions sometimes formed a purely mechanical obstacle to the entrance of the air into the bronchi, it was the spasm alone which most generally arrested and embarrassed the respiration by contracting the air-passages. M. Bretonneau opposed this view, considering the mechanical obstruction produced by the concretion to be the entire cause. As to the intermissions, "they are comprised," said he, "in a numerous class of pathological phenomena. What practitioner has not seen an example of the kind? Do not scirrhus diseases, calculi, and many other permanent causes of pain, reveal their presence in an intermittent manner?" This spasmodic element, if it does not have that entire influence accorded to it by some, seems to me, however, to play at least a considerable rôle in croup, as well as in those chronic affections taken as examples by my illustrious master.

The paroxysms become more frequent and severe up to the time of death, the intervals of ease growing less and less, the laryngo-tracheal sound being continued. From time to time, the poor children suddenly sit up in a state of agitation difficult to describe, seizing the curtains of their bed, which they tear in their movements of convulsive agony; sometimes they scratch the paper upon the walls with their nails; they throw themselves about the neck of their mother or persons around them, embracing them. At another time, they exert their powerless efforts upon themselves, seizing with their hands the anterior part of the neck, as though they would pull away something which strangled them. The face swollen, purple, their eyes haggard and shining, express the most painful anxiety and the greatest terror. The child then, worn out, falls into a kind of stupor, during which time the respiration remains difficult and hissing. Then the face and lips are pale, the eyes dull. Finally, after a terrible effort at respiration, the agony commences and the struggle ends.

In the adult, the picture is still more terrific. The violence of the paroxysms of suffocation, the kind of rage which possesses the dying victim, strangled by an obstacle which he cannot get rid of, are impossible to be depicted. At last, when the lips become livid, when the face is swollen, purple, at the end of the asphyxia, the adult, like the child, falls into a kind of stupor and of intoxication, and ordinarily dies in a state of prostration. "*Sic irrequieti assidue jactantur, donec penitus prostrati jaceant et strangulati pereant.*"—(Borsieri.) I

say ordinarily, because it is true that in some exceptional cases, the patient suddenly dies in a fit of suffocation.

The intermission of the paroxysms of suffocation, I said just now, was a fact essential to know, because it might lead into error. Suppose, for instance, that having been called to see a case of croup, you have applied leeches, or have bled in the arm or the foot, or given an emetic, or applied a blister over the neck or chest; and suppose that immediately afterwards there comes on one of those moments of ease of which I have spoken, you would refer it to the efficacy of the remedies employed, while it would be nothing more than the natural progress of the disease. It is therefore important to be aware of this. Still, independently of this intermission, due to a spasmodic element, there is another, occasioned by the expulsion of the false membranes, which produces the suffocation.

It sometimes happens, not often, yet perhaps once in six or eight cases, that in an effort of vomiting or of cough, the larynx is suddenly relieved by the patient, whether a child or an adult, throwing off pieces of false membrane or membranous tubes from the trachea and glottis. At the same moment, relief instantly follows, the same as after tracheotomy. The patient sleeps tranquilly, and this tranquillity may last four, six, eight, ten, fifteen or twenty-four hours. The parents have renewed hopes, and the physician is tempted to indulge in them; but this fact should not be lost sight of, that diphtheria is a disease which, if it grants occasional respites, does not so easily pardon. It should not be forgotten that when a false membrane is detached from the larynx and trachea, another is soon formed; that the exudation, running through its stages again, lines once more the parts, at first with a thin covering, which gradually thickens, re-establishing the obstacle which before existed. The same paroxysms take place, and if these new diphtheritic concretions are again expelled, there is reason to fear that they will again be formed. I have seen children throw them off three and four times, and finally succumb to them; while again, I have seen, but under circumstances unfortunately very rare, complete recovery follow the spontaneous expulsion of the false membranes. There are, I repeat, exceptional cases; so rare, that during quite a long medical career, during which I have seen a large number of children and adults afflicted with croup, I have met only six cases.

It is a remarkable fact, that while the expulsion of the false membranes offers incontestably to the patient favorable chances of recovery, these chances are lessened, if, the recovery not taking place spontaneously, you are finally obliged to perform tracheotomy. In a word, this operation succeeds better in a child who has not thrown off any false membrane, than in one who has, and the reason of this you will presently see.

The presence of the false membranous concretions in the larynx and trachea proves that the diphtheritic inflammation has invaded these organs. The expulsion not only does not hinder the extension of the disease, but rather favors it. After tracheotomy the disease seems to be arrested. But the expulsion of the false membranes, deferring the time of interference upon the part of the physician, yet permits the

inflammation to extend, so that in a child who has been relieved of the false membranes by vomiting or by coughing, who has consequently experienced a momentary amelioration, which has deferred the operation twenty-four hours, you run the risk of finding the bronchial tubes affected even to their smallest ramifications; whilst in another, upon whom the operation of tracheotomy has been early performed, this does not occur under ordinary circumstances.

I say under ordinary circumstances, because there are other circumstances very infrequent, it is true, less frequent than is usually supposed, where the disease, instead of proceeding from the pharynx towards the larynx and trachea, follows an inverse order, first attacking the trachea, and even commencing in the bronchi, and then ascending towards the larynx. In fact, diphtheria, manifesting itself simultaneously upon different parts of the body, may become developed in the interior of the larynx, trachea, and bronchial tubes, at the same time that it is observed upon parts accessible to the sight. This is what absolutely took place in the little boy in the ward St. Bernard, which case I have already mentioned. The following is another similar case, an account of which was taken by my chef de clinique, Dr. Blondeau, while he was interne at the Hôpital des Enfants, under M. P. Guersant.

A little boy three years and a half old was brought to the hospital the 9th of November, 1847, presenting all the rational symptoms of croup. He had been taken on Saturday, October 30th, with a fever, and on the following Monday measles appeared, which lasted up to Saturday; the eruption not being very severe, the catarrh, on the contrary, being well marked. On Saturday, and still more the next day, the attention was attracted to a noticeable difficulty in the respiration, and a hoarseness in the voice, which continued to increase.

At the time the child entered the hospital the following symptoms were observed: countenance pale, of a bluish color; considerable difficulty in breathing. The nasal fossæ were filled with a thick grayish mucus, yet on examining the throat very carefully, no appearance of false membrane was discovered. The patient was vomited, but it was not followed by the slightest relief. The restlessness and oppression were excessive, the pulse 120 a minute. Upon auscultating the chest, sonorous râles were heard.

The presence of exudations evidently diphtheritic in the nasal fossæ, giving rise to the idea that false membranes might exist behind the veil of the palate, a mop wet with a strong solution of nitrate of silver was applied to this region. It increased the restlessness to a considerable degree.

It is a fact worth mentioning, that the submaxillary ganglions were never engorged, and it is explained by the absence of any lesions in the larynx. An emetic of tartarized antimony (5 centigrammes) was prescribed.

Nov. 10, quieter, less dyspnoea, but the cough hoarse; voice gone; the face still bluish, and the nasal concretions persisting. The pulse small, thready, 128. The emetic was repeated, which did not produce vomitings, but the patient had ten green passages from

the bowels. The oppression returned in a greater degree, and the inspirations increased to forty-six a minute. There was orthopnoea. The voice was completely extinguished; expiration was noiseless; inspiration noisy, hoarse; cough very hoarse. The nose and the ears were cold, the bluish tint of the face increased; the eyes, always almost closed, had an expression of languor. The poor child moved its head from side to side, as though seeking an easier position, but soon he became quiet on account of the state of asphyxia, probably increased by the feebleness following the frequent passages from the bowels. The mind remained clear.

During the night he had two violent attacks of suffocation, and the next day the asphyxia was greater than the night before. The face was pale, swollen; the lips dark, cold. The clearness of the mind appeared perfect, the child expressing by signs that it wished to drink; deglutition was performed perfectly. Death during the day, without a resort to tracheotomy; the progress of the disease rendered it useless.

At the autopsy, the air-passages were found lined with thick, false membranes, from the larynx to the first bronchial ramifications; below that, the bronchi were filled with thick mucus. In the nasal fossæ, the exudations seen during life were formed, but there were no false membranes, properly speaking, and there was no trace of them, either in the pharynx or in the mouth.

In fine, to repeat what I have just said, and it is a point of sufficient importance to warrant a repetition, although the expulsion of false membranes can bring about the spontaneous cure of croup under some rare circumstances, it is evident that in cases where the disease has followed its progress downward, which is the most ordinary course, the chances of success of tracheotomy are much less favorable in those previous cases in which membranous tubes have been discharged, as that indicates the propagation of diphtheria to the bronchial apparatus. This extends sometimes very far, and we have had occasion to see children who had been subjected to the operation of tracheotomy eject false membranes, moulded in the form of the small bronchial ramifications. I have still in my cabinet one of those false membranes, which I have shown to you, and which was obtained in your presence, at the autopsy of a little girl who died in our ward, Saint Bernard. This diphtheritic aborization comprised the trachea, the bronchi, and extended even to the fourth ramifications. I have met with a similar case in a child of five years, who was cured by tracheotomy; the false membranes were detached at the very moment of the operation.

Most generally, indeed in two-thirds of the cases, according to the statistics given upon this subject by M. Bretonneau, and subsequently by Dr. Hussenot, in his Inaugural Thesis, (Paris, 1833,) pseudo-membranous concretions do not pass beyond the trachea. This is a remarkable fact, and I shall hereafter call to your attention a circumstance favorable to the success of tracheotomy.

One word now, gentlemen, concerning *accidents and general symptoms*. At the outset, I told you there is a *febrile movement*; there is

also apparent *ganglionic swelling*, more considerable than in some other kinds of angina; less, however, than in scarlatinous angina; less also than in malignant diphtheritic angina, of which I shall speak to you hereafter. This febrile movement continues a day or two, and ceases entirely when the disease is prolonged. The soreness of the throat is so slight, that children four or five years old, who can tell how they feel, do not complain of it. This almost complete absence of general symptoms, and of sore throat, permits the disease to advance insidiously to such a degree, that the physician is only called when the affection has attacked the larynx; that is, when croup is fully declared. Then, also, the pseudo-membranous concretions, which at first held possession of the pharynx, have had time to become detached, and it is with difficulty that even a few traces of them can be found on the tonsils, or on other points of the mucous membrane of the palate. This is an important fact; it explains very many cases in which pseudo-membranous laryngitis has been believed to have been developed at the very outset, without having been propagated from the pharynx towards the inferior parts.

Here, gentlemen, is the place to speak of this croup *d'emblée*; it is well worth our while to stop and consider it. You will hear it said by men of admitted experience, that they have often seen children die of croup whose pharynx had not been involved. Before M. Bretonneau read, in 1818, before the Academy, his first paper on diphtheria, before the publication, in 1826, of his treatise, the fact was generally admitted, that membranous croup commenced with the larynx. M. Bretonneau caused a revolution in science by asserting and demonstrating that almost always, at least nineteen times out of twenty, it was not so, and that the disease commenced with the pharynx. Guersant, his friend, and for a long time physician of the Children's Hospital, after having supported the former opinion, when once his attention had been awakened to the subject, soon gave in his adhesion to the latter opinion, which became also that of all those who, from that time forward, as well at Paris as everywhere else, paid any attention to the matter. For my part, I declare to you, that having seen perhaps more cases of croup than the busiest physicians of the capital, for the reason that, on the one hand, I remained eighteen years in charge of the sick children in the hospital, and because, on the other hand, having introduced here the operation of tracheotomy in the treatment of laryngeal diphtheria, I have the honor of being often called in consultation to judge of the propriety of the operation,—I declare to you, that the proposition enounced by my venerated master is true, and that in the generality of cases, croup commences with the pharynx.

I do not deny that there is such a thing as croup *d'emblée*; I not only do not deny that the pellicular disease can commence at the very outset in the larynx, but I even admit that it may, under certain very rare circumstances, attack in the first place the bronchi. Guersant and many others have cited examples of this. According to the report of Dr. Yvaren, of an epidemic which prevailed at Avignon during the year 1858, this form of the affection, commencing at the very

outset with the larynx and the bronchi, was that which the disease more especially assumed. I myself, indeed, have called your attention to two cases in which the disease appeared simultaneously in the bronchi, the trachea, and other parts open to view. Why should it be a matter of surprise that diphtheria should be localized from the commencement on the laryngeal mucous membrane, as it is localized on the nasal, buccal, vaginal mucous membrane, etc.? I do not deny that croup may commence with the larynx; such cases are, however, rare and exceptional. The reasons for the belief that the former is the most frequent order, are, that a sufficient attention had not been paid to the examination of patients; that the throat was not examined with all the care which should have been given to it; that above all, the physician often came too late, that is to say, when the laryngeal concretions had had time to disappear, as I have just told you; this being so on account, as I have also told you, of the slightness of the general or local phenomena, the forerunners of the disease. Under similar circumstances, when you shall be called to attend a child who is said to have had the croup for about two days only, recall the recollections of the parents, and you will learn that the child had been suffering for a much longer time; that for five or six days he had not eaten as well as usual; that he complained of some difficulty in swallowing; that he refused to take any nourishment in any degree hard, as a crust of bread; you will also learn that there was a slight swelling of the neck; and these are certain indications of sore throat, and of the previous existence of false membranes, which you can no longer see.

To return to these general phenomena: in the treatment of the diseases of children, be very distrustful of those accidents which are so slight in appearance, but which may yet be the commencement of a terrible disease. When you see a child suffering for some days from a slight indisposition, accompanied by an insignificant feverish manifestation, and not able to tell you himself where he suffers, direct your attention at once to the throat; depress the tongue in such a manner that you can see even to the bottom of the pharynx, and in a great number of cases you will see that this slight indisposition announced the commencement of diphtheria, and you will find pseudo-membranous concretions on the tonsils or the veil of the palate.

In the case of the adult, matters go on very much in the same way. The general restlessness, the feverish manifestations, are hardly noticed; there is scarcely any sore throat, and you will even meet with patients having the pharynx lined with false membrane, who will complain of nothing but a slight difficulty in swallowing; but here the danger is even greater than with the child. For the adult having in fact the opening of the larynx proportionally larger than it is in the child, and the calibre of the trachea being greater, the air finds a sufficient passage even when the walls of these passages have already begun to be covered with pseudo-membranous concretions; and when the symptoms of croup declare themselves, diphtheria has had time to become deeply fixed in the bronchial ramifications.

These phenomena had for a long time impressed me, for I had the very best of opportunities to observe them in the epidemic at Sologne,

which I was commissioned to examine into in company with Dr. Ramon, in 1828. Permit me, gentlemen, to report to you a few of the facts of which I was then a witness.

I was one day—and it is a day too memorable for me to forget it—I was one day dining with a Mr. Bethune, whose chateau is situated a short distance from Selles, in the department of Cher, when a peasant came for me in great haste to see his wife, who, he said, was choking. I went immediately to the patient. I found a woman about twenty-six years of age, still clad in her fête dress. It was Pentecost Sunday. She had been to mass in the morning, more than a quarter of a league from there; after having returned on foot, she had dined as usual, and was just preparing to go to vespers, when she was suddenly seized with such a violent attack of suffocation, that her husband feared she would not live until we could reach the spot. The unhappy woman was in fact expiring when I saw her. I examined the throat at once; I discovered thick, false membranes lining the pharynx. The nature of the disease was from that moment sufficiently clear to me, and the poor woman being *in extremis*, tracheotomy alone could prevent immediate death. Without a moment's hesitation, I prepared to operate. I was alone, with no other assistant than the husband, without any other instrument than a pen-knife with a convex blade, which I fortunately had with me; then I was obliged, in default of a tracheal canula, to manufacture a sort of rude one out of a leaden bullet, which I flattened with a hammer, and fashioned into a kind of tube. Unfortunately, the false membranes had already penetrated into the small bronchi; the patient died the next day.

The spontaneous appearance of the accident in this case gives you the measure of the slight degree of intensity of the general phenomena which for six days had preceded them; this fact supports what I have just told you concerning the slight influence which pharyngeal diphtheria, a disease which seems to confine itself to a local manifestation without serious importance, so long as it is limited to the pharynx—the slight influence which diphtheria ordinarily has upon the general condition of the human economy in the early days of the disease.

In a village of the department de l'Indre, in which the epidemic prevailed, the garde champêtre, seventy-one years of age, was busily engaged in the performance of his duties, when I saw him seized with false membranous angina, of which he died the following day, after frightful spasms of suffocation.

In that very same commune, a family was pointed out to me, several members of which had fallen victims to the disease, and I was called to attend upon a little girl who was attacked by it. When I reached the house she was absent, and it became necessary to go for her into the fields, where she was watching turkeys. I waited for her an hour; when she arrived, she was panting, and could hardly breathe. During the evening, she died of croup. Although that very day the poor child had made no change in her usual mode of life, she had, however, been sick for eight days; but sick without general symptoms of any gravity, however, since, as well as the woman of whom I have just spoken, and also the garde champêtre, she had continued to eat, to drink, and to go about her duties as usual.

Do not forget these facts, gentlemen: do not forget that in a great number of cases diphtheria has not, at the beginning, any apparent gravity. If there is fever during the first twenty-four hours, or the first two days, very soon there is no more of it, or indeed the fever is insignificant. The disease is merely announced by a slight difficulty in deglutition. The difficulty in breathing does not come till later; but then the disease has attacked the larynx, and it will sooner or later strangle the patient.

The prognosis of so terrible a disease is necessarily most unfavorable. Left to itself, it is almost invariably fatal. Here are a few examples: During the epidemic at Sologne, above mentioned, the prefect of the department Loire-et-Cher informed me that the neighboring communes of Ferti-Beauharnais were ravaged by malignant angina. I went thither, and at two farms of the commune Frembleviv, the farm du Roi David and du Grand-Pied-Blain, I was present at the most harrowing spectacle I ever witnessed. At one of the farms I found only the head of the family and a single servant-girl only sixteen years old. The man was seated in the chimney-corner, and did not even rise to receive me. He was twenty-seven years old. He told me that he and the young girl whom I saw near him were the only survivors of seventeen composing his household and that of the neighboring farm. The young girl had herself been ill, but she had been cured by the curé of Frembleviv, who had touched her throat eight or ten times with spirits of salt, (chlorhydric acid.) As for him, he knew the fate that awaited him. To-morrow or the next day, he said to me, I shall die as have died my children, my wife, my father, and my mother. In his fatalism, he awaited the issue, without wishing to do anything to evade it. I examined his throat, however; the tonsils were completely covered with pseudo-membranous concretions; the state of his respiration and of his voice showed me that the larynx had not yet been attacked. I endeavored to inspire him with hope, and citing to him the example of the young girl who was with him, I told him that all was not lost; that he might be cured if he would consent to be treated as his servant had done. He allowed himself to be persuaded, and with the blessing of God, my treatment had the desired result. This man was saved.

Such, gentlemen, is the terrible mortality which diphtheria draws in its train. Out of seventeen individuals two only escaped death, and these, even, owed their safety to energetic treatment.

Three years before, in another department, the epidemic had made such ravages in one of the villages in the neighborhood of the Chapelle-Véronge, near the Ferté-Gaucher, that out of sixty children, almost all of the male sex who were attacked by the disease, sixty succumbed. This fact has been reported by M. Ferraud, who mentioned it in his inaugural thesis on membranous angina, before the Faculty of Paris, in 1827.

When I arrived at Sologne, I found the physicians discouraged to such a degree that some of them were no longer willing to see the patients attacked by malignant angina, and the priests assured me that every one who was seized by it inevitably died. At Marcilly, in

Villette, sixty-six persons out of six hundred and fifty inhabitants (more than one-tenth of the population) had been carried off by the *white sore throat*; thus the priest of that parish had denominated the disease. At a later period, it is true, there were cures, when a medication entirely empirical had been put in practice; this was the employment of alum mixed with vinegar, a means used in the country in the treatment of sheep and hogs for sore mouth and sore throat.

Pharyngeal diphtheria is therefore almost invariably fatal, unless there is an early interference to arrest its progress; for although there are forms of the disease which, whether well or ill treated, almost always terminate fatally, that form which we have been considering is most ordinarily cured by the use of therapeutic means, of which I shall have occasion to speak to you.

Independent of the accidents consequent upon diphtheria, which I shall make the subject of an especial lecture—I refer to paralysis—there are certain *complications* which augment the dangers of the disease, and dispel the hopes of the physician at the very moment in which, by energetic treatment, he had checked the progress of the disease and counted upon a cure. I allude to *entiritis*, so frequent in children; to *pneumonia*, pointed out by Geisi; to *interlobular pulmonary emphysema* produced by the rupture of the vesicles broken during efforts in coughing.

The child to whom reference has several times been made is an example of the perineumatic complication which we have often met with elsewhere; and latterly we found, on the autopsy of another child, pulmonary emphysema. This little patient was brought to the hospital in the last stage of croup. He was expiring when the ward surgeon performed tracheotomy. The following morning, fifteen hours after the operation, the child suffered much from oppression. We hastened to clean out the internal canula, which was obstructed, but the dyspnoea continued as before; we heard, besides, a peculiar sound during expiration, produced by the passage of the air through the instrument, that sound which I have called *serratic*, (*stridor serraticus*,) comparing it to the shrieking of a saw (*serra*) in its passage through the wood. This sound is a prognostic sign of great value and grave importance; when I hear it, after having performed tracheotomy on a child, I know that that child will infallibly perish. Such was the case with our little patient, who died during the day. On opening the cadaver, we found the larynx lined with false membranes, which also entirely covered the tracheal artery, the bronchi, and all their ramifications, even the most minute; several lobes of the lung were separated by great bubbles of cellular tissue distended by air, which, having ruptured the vesicles, had brought on this interlobular emphysema.

This lesion, which M. Bretonneau remarked in two cases in his Treatise on Diphtheria, one that of a soldier of Vendée, the other that of a child in the epidemic de la Ferrière, is produced by violent efforts of inspiration in the very same manner as it may be produced in whooping-cough, as the consequence of violent and repeated fits of coughing. In the case of children subjected to tracheotomy, you will sometimes see this emphysema so very great that it will extend to the cellular

tissue of the neck, the shoulders and the thorax; it is by no means, as might perhaps be believed, the consequence of the operation, but existed before.

EDITORIAL AND MISCELLANEOUS.

—The one absorbing subject which has occupied the thoughts and directed the actions of all during the last month, and which still engrosses the attention, is war; war of the severest character—a civil, fratricidal war. Here, slow to accept the dire necessity, the people, once resolved upon the choice of alternatives, have, with unparalleled unanimity, arisen to meet the crisis, and all hasten to act with their whole might in the sphere of their respective duties.

Armies are usually of comparatively slow growth; here they have leaped into existence like Minerva from the head of Jove. The assembling of such large bodies of men for war purposes calls for many expressions of patriotism in deeds as well as words. How grandly the people have responded, the events of the last month tell. If long-continued peace found us unprepared to rush to arms fully equipped in all that constitutes a well-appointed army; if, in mustering into active field service the volunteer soldiery, there should occur some mistakes, they must be attributed to the rapidity of the movement rather than to other causes. Faults must inevitably become apparent; some of omission, others of commission. Time and experience will disclose the one and remedy the other, and the active and enthusiastic ready intellect of our people will supply deficiencies, suggest improvements, and find a remedy for all evils.

Where all are working, the medical profession is not the least active. In many ways our profession becomes a leading element in the activity around us. Our province is beneficent; and under the direction of well-chosen members of our profession, preparations are being made to meet all the requirements which a long and severe campaign may demand.

A Medical Association for the supply of lint, bandages, and all needed surgical and hospital stores, has been organized in this city under proper officers; and throughout the country, in almost every town and city, societies having similar objects have been instituted.

It is proposed, also, to prepare suitable female nurses, to administer to the wants of the sick and wounded of our volunteer soldiery. Already several hundred of our kind and generous-hearted women, emulating the example of Florence Nightingale, have volunteered their

services. A Board of Management has been appointed to select from these only such as are best fitted for the duty, and the hospitals of our city have united in affording them every facility to become practically acquainted with the duties which will be required of them, so that they may enter upon them in the most efficient manner.

In active field service there is always a deficiency of surgeons. The experience of the Crimea and the Italian Campaign was no exception to this rule. A full surgical corps is greatly to be desired, and an efficient ambulance corps gives confidence to soldiers. This is a necessity which will be carefully watched over and supplied. Most of the regiments leaving this city have been attended only by a surgeon and a surgeon's mate; quite sufficient when on a peace footing, but altogether inadequate to the labor devolving upon these officers at the time of an engagement. In many of the armies of Europe there is a surgeon to every hundred men, and such should be at least the proportion here. The number of surgeons attached to a regiment being limited by law, many who are anxious to serve their country will have to wait until there is a crying demand for them. In the mean time, however, they too are preparing to act with more efficacy. To this end, in order to familiarize those who propose to enter into this service with some of the details requisite in the camp, instruction on military surgery is given in most of our large cities. In this city, Prof. Hamilton, at Bellevue Hospital, and in Boston, Prof. Bigelow, have commenced courses of lectures, with demonstrations, the lectures being free to all. Such as desire can avail themselves of the opportunity of performing on the dead body all the operations belonging to military surgery. These courses are most fully attended. The benefit of them will be felt by our soldiers. They will be attended by men who have prepared themselves for the emergency.

—The Academy of Medicine has devoted the greater portion of several of its later sittings to the consideration of the subject of morbus coxarius. The Section on Surgery had previously discussed the subject at great length, and had recommended it to the Academy. Dr. A. C. Post opened the discussion, by giving a concise history of the pathology and treatment of hip disease. He was followed by Drs. Batchelder, Buck, Sayre, Wood, Parker, Raphael, Krakowitz, Bronson and others, and by invitation, Drs. Bauer and Davis, who were present, participated in the discussion. Little was said that was novel as regards the pathology of the disease, but the mechanical treatment, brought to such a degree of perfection by the surgeons of this city, was minutely explained, thoroughly criticised, and universally

commended. The principle upon which the mechanical treatment is based is the separation of the impinging surfaces of diseased bones by means of carefully-applied splints, producing extension and counter-extension, and admitting of motion of the joint. This treatment has been the gradual growth of years. As early as 1835, Dr. Harris, of Philadelphia, is said to have applied extension and counter-extension by means of Gibson's modification of Physic's long splint, with success in four cases. A report of these cases was made early in 1839, but, as Dr. March states in his paper on morbus coxarius, "without giving any explanation of the theory or principles upon which the practice is founded." Later, the treatment was proposed by Dr. March, of Albany, as an entirely new treatment. He found he had been anticipated by Dr. Harris. Dr. March, however, explained in his paper just referred to, which was read before the American Medical Association, and printed in the Transactions of that body for 1853, the theory of the treatment. "*The most important part of the treatment,*" says Dr. March, "*consists in the keeping of the joint in a perfect state of repose.*" This is accomplished by a splint. "Extension and counter-extension are used with a view to prevent undue pressure on the delicate and tender surfaces of the diseased bones." "In the advanced stage of the disease," continues Dr. March, "the cartilages of the acetabulum and of the head of the bone are destroyed; the carious and loose spongy tissue is covered with coagulated lymph, and this, adhering to the surface of the bones, becomes highly vascular. Now if these two surfaces, thus covered with *organized* or *organizable* matter, could be kept in easy apposition and at rest—without too much pressure on the one hand, and on the other without exerting too much separating or sundering force—in many instances a bony ankylosis would be the result."

This is the first record we have of the mechanical treatment formulated upon known pathological conditions. But Dr. March does not seem to have proposed it for other than the latter stages of the disease; for, in the early stage, he says "it will be important to resort to the use of the long splint, to maintain the joint in a state of rest, that the inflammation may subside;" while extension and counter-extension, it appears, were used by him in the advanced stages, to prevent the deformity of the limb.

Next in order to Dr. March is the treatment proposed by Dr. Bauer, of Brooklyn, by means of an apparatus similar to the *double gouttière* of Bonnet, of Lyons, having, however, attached to it a foot-piece allowing of extension. This apparatus is made of wire, and has been dubbed with the *sobriquet* of the "wire breeches." This appa-

ratus keeps the limbs immovable, and permits the patient to be carried about.

In April, 1860, Dr. H. G. Davis described in this journal a method of treating hip disease he had employed for many years. The principle upon which his treatment was founded was the application, by means of a corrugated steel splint, of extension and counter-extension, permitting at the same time the patient to take active exercise in the open air.

For the steps of the treatment and an explanation of the splint used, we refer to Dr. Davis' paper in the MONTHLY for April, 1860. In this instrument is combined all the suggestions made by Drs. Harris and March, with the addition of *elastic* extension applied in all stages of the disease, not for the sole purpose of preventing or overcoming a deformity, but as a curative means, and with that freedom of action to the patient wearing the splint which permitted him to take exercise and air, so important to the general health. This was attempted to be accomplished in a measure by Bauer's wire breeches, but is positively accomplished by the Davis plan of treatment. The report of the Section on Surgery, and the remarks made by most of the surgeons who participated in the discussion at the Academy, gave Dr. Davis the credit of having introduced the methodical plan of treatment to the profession.

To the steel splint of Dr. Davis several modifications have been made by Dr. Sayre, Dr. Davis himself, and others.

Dr. Sayre differs from most of the profession in his views of the etiology of the disease. He holds that, with few exceptions, the disordered action of the joint can be traced to direct traumatic influences, and not to a strumous origin, as is the almost universal opinion. He believes that the effects have been mistaken for the causes; the scrofulous cachexia being consecutively developed, and therefore being the results, and not the causes, of the disease. In these views he is sustained by Dr. Bauer, of Brooklyn.

— We have to notice with deep regret the death of a valued contributor, Dr. E. J. Fountain, of Davenport, Iowa, whose communications to medical science in the pages of this and other journals of the country during the last few years, have made his name familiar to all.

Dr. Fountain was a native of this State. He was born in Westchester County, was graduated at Princeton College in 1847, and at the College of Physicians and Surgeons in this city in 1851. He was for some time one of the surgeons to the Panama Railroad Company. In 1854 he went to Davenport, Iowa, where he died on Friday, the 29th of March. The *Chicago Tribune*, in mentioning his death, gives the following account of the circumstances:

For some time past Dr. Fountain had been continuing, at the suggestion of the American Medical Association, his researches upon the properties of chlorate of potassa as a remedy in phthisis, taking the ground that the article when pure was almost entirely harmless in large doses. Under this conviction, he took upon several occasions doses of half an ounce, and on Friday, at 10 A. M., he took one ounce dissolved in a pint of water. No serious symptoms occurred through the day, except a profuse diuresis and discoloration of the superficial circulation, and he visited his patients as usual. Having eaten a hearty supper in the evening, he returned to his house, where he was shortly after seized with severe pain in the abdomen, and so greatly prostrated as to be unable for some time to call assistance, (being alone in the house, his wife being absent at the East.) He expected to die in this condition, but by a desperate effort, succeeded finally in calling his neighbors, who sent for his partner, Dr. Adler. His symptoms were after a time partially relieved, but soon he was seized with vomiting, ejecting a dark-colored, greenish fluid, being unable to retain any nourishment; the secretion of the kidneys was also entirely suppressed. This condition continued, with a gradual increasing prostration of the system, (the mind being perfectly clear,) for seven days.

The post-mortem examination revealed extensive inflammation and disorganization along the whole course of the intestinal canal, with adhesions agglutinating nearly the whole of the abdominal viscera; the gall-bladder distended with a thick dark-colored fluid; the kidneys enlarged and lobulated externally, the internal surface and substance engorged, and the uriniferous tubes distended, containing frequent points of a crystalline substance, which was, without doubt, chlorate of potassa; and the bladder entirely empty, contracted and inflamed.

As a full statement of the case will be published, it is unnecessary for us to dwell further upon it.

In the death of Dr. Fountain, the profession in the Northwest has lost one who was destined to prove one of its brightest ornaments, and the community in which he lived, one of its most valuable citizens.

— The translation of "Scanzoni on Diseases of Females," by Prof. A. K. Gardner, announced by us a few months since, has been recently issued. It is a beautifully-printed and finely-illustrated volume, of nearly 700 pages. The work of the translator has not been solely confined to the conversion of the text of this volume into English. Numerous judicious annotations have been made throughout the book. We shall at another time give an extended notice of this volume. The publisher, Mr. R. M. De Witt, of this city, deserves the thanks of the profession for issuing the work in so readable a type and on such excellent paper.

— The Lectures of Dr. Thomas, one of which appears in this number of the MONTHLY, have been received with great favor by the medical press in this country and abroad. We learn from a friend who was in Germany during the last summer, that one of them has received the honor of a translation and separate publication in pamphlet form.